

A better machine. A better magazine.

# MacAddict

## the Future of the Mac

**You Ain't Seen  
Nothing Yet!**

- Incredible Power
- Massive Storage
- Dazzling Displays

### DV Magic

Digital Video pros share their secrets

### Encyclopedia of Networking

All you need to know, from ABC to XYZ

### QuarkXPress 5.0 & Adobe InDesign 2.0

Our experts test, review, and rate 'em—is it time to switch?

### REVIEWED:

Adobe After Effects 5.5, Civilization III, Digidesign Mbox, OmniPage Pro X, SmartScore 2.0, and more...



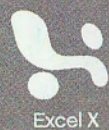




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**It's the purest Mac version ever.  
The fact that it glows in the dark is nice too.**





Introducing Microsoft® PowerPoint® X, just part of the new Office v. X for Mac. We redesigned Office for one reaction, and one reaction only—total awe. By throwing out stale, irrelevant code, we created the most stable, most responsive Mac version yet. As a truly native application, it dazzles with the brilliant Aqua interface through and through. The new PowerPoint even saves presentations as QuickTime movies. This is one Office that won't leave you fumbling around in the dark. [microsoft.com/mac](http://microsoft.com/mac)

Microsoft  
**Office:mac**  
v. X



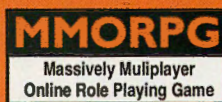
# Lineage™

Lair of Valakas

# Macworld Best



NCsoft™



For more information, subscription fees, downloading Lineage or acquiring a CD go to <http://www.lineage.com>.  
Internet connection and online fees required. Mac OS X v10.1.2. © 2002 NCsoft Corp.





# of Show 2002!

Get it on this issue's MacAddict CDROM!





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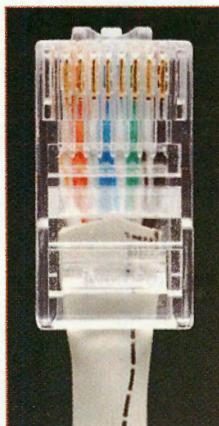
Join us—and a host of tech experts—for a trip into the future. Take a peek at the technologies that will invade your home or office in the next five years. **by Cathy Lu**



Miss Cleo says the Mac's future looks bright, mon.

### 32 The Encyclopedia of Networking

Do you *really* know the difference between a router, switch, bridge, hub, and gateway, plus how to get the most out of your network? If you don't, we're here to help. **by Rik Myslewski**



Ethernet Pops—now in four fruity flavors!

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Take a behind-the-scenes look at the making of the movie *Waking Life*, a Nine Inch Nails DVD, and a special-effects short film, all done courtesy of a couple of MiniDV cameras and the Mac. **by Narasu Rebbapragada**



DV goes MOMA.

## how to

### 66 Design Pages with AppleWorks

AppleWorks may be your trusty word-processing and spreadsheet app, but you can also use it to design pages like the pros. Learn the basics of page layout as we show you how to create an ad. **by Kris Fong**



Come on in, the water's...freezing!

### 72 Work Faster and Easier with ACTION Menus

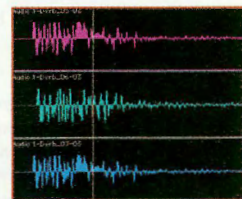
All you type-A personalities will benefit from this. Not only are we giving you the full version of ACTION Menus on this month's Disc, but also we show you how to use it to set up custom menus and keyboard shortcuts. **by Kris Fong**



Megamenu madness!

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Does your belch register on the Richter scale?

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From MacAddict's Cyrillic edition.



Cover photographed by Mark Madeo.

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## every month

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Does the new G4 iMac live up to the hype? Are the iPod's earbuds too big? Can your Power Mac G4 handle slab meats and the major wieners?



I'll show you,  
athlete's foot fungi!



Stand back, or this giant starfish  
will suck the life out of you!



Only one man can be  
King of Kielbasa.

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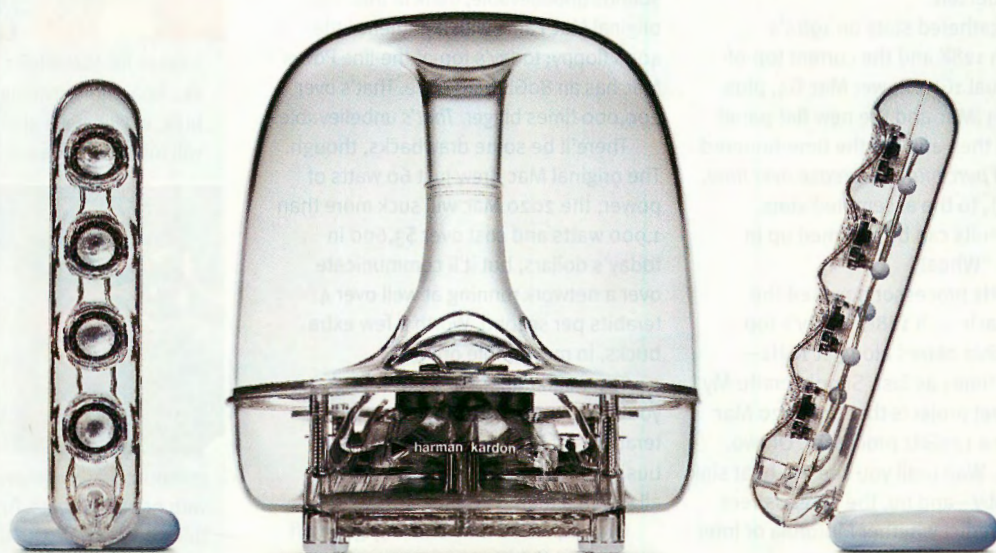
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# editor's note

A message from the kernel.

**T**o prepare for this month's cover story, "The Future of the Mac," *MacAddict* executive editor Cathy Lu interviewed a who's who of industry luminaries, pored over a mountain of documents, and scoured the Web for insight into the latest technologies. Solid journalism from a solid journalist.

Being more of an unrepentant geek than a seasoned journalist like Cathy, I took a different tack: math.

Rather than relying on the prognostications of fallible liveware—humans—I used cold, hard numbers to project the Mac's future. My goal was simple: to discover the extent of growth in Mac power in the first 18 years of its history and to project that rate of increase over the next 18 years. In one simple spreadsheet, I could divine the power of the Mac of 2020.

A silly way to predict the future? Of course—as every investor has been repeatedly warned, "Past performance is not an indicator of future returns." But hey, hiding behind numbers is a good way to deflect criticism when predictions get wacky. Just ask Enron's buddies at Arthur Andersen.

First I gathered stats on 1984's Macintosh 128K and the current top-of-the-line Dual 1GHz Power Mac G4, plus the first G3 iMac and the new flat-panel G4 iMac. I then applied the time-honored formula of *percentage increase over time*,  $x = n (p^t)$ , to the assembled stats.

The results can be summed up in one word: "Whoa!"

An 8MHz processor powered the original Macintosh 128K. Today's top PowerPC chip blazes along at 1GHz—that's 125 times as fast. Simple math: My spreadsheet projects that the 2020 Mac will house a 125GHz processor. Or two. Or sixteen. Wait until you see the heat sink on *that* baby—and no, the spreadsheet couldn't predict whether Motorola or Intel will manufacture that processor.

With its measly 128K of RAM, the original beige box covers in abject terror of the 2020 Mac, which will come equipped with over 2 terabytes of RAM. And that'll just be its standard config—it'll max out at nearly 19 terabytes. (A terabyte is 1,024 gigabytes, or  $2^{40}$  bytes.) How will that teraload of RAM talk to the 125GHz



**Rik grabs his crystal ball and throws a high hard one.**

processor? Over a 256-bit-wide data path running at a bus speed of 2,211MHz. That puppy will finish complex Photoshop filters *before* you hit the OK button.

Want more storage space for your iMovies? Just wait until 2020, when your Mac will come stuffed with nearly 17 petabytes of storage. (A petabyte is 1,024 terabytes, or  $2^{50}$  bytes—that's 1,125,899,906,842,624 of the little buggers, if you've misplaced your calculator.) If that sounds unbelievable, think of this: The original Mac came with a pathetic little 400K floppy; today's top-of-the-line Power Mac has an 80GB hard drive. That's over 200,000 times bigger. *That's* unbelievable.

There'll be some drawbacks, though. The original Mac drew just 60 watts of power; the 2020 Mac will suck more than 1,900 watts and cost over \$3,600 in today's dollars, but it'll communicate over a network running at well over 4 terabits per second. Worth a few extra bucks, in my humble opinion.

The 2020 iMac? For a mere \$1,299, you'll get a 531.5GHz processor, 14.6 terabytes of RAM, an 893MHz system bus, 94 petabytes of storage—and it'll all weigh a mere 11 ounces!

OK, OK, we've now officially gone off the deep end.

Or have we? Only time will tell—after all that's transpired over the past 18 years, nothing surprises me anymore. So do me a favor: File this page away someplace safe, and then pull it out in 2020 and compare these "do the math" predictions with what Cupertino's shipping at the time. Might be interesting. —Rik Myslewski

## Staff Rants



### Chris Imlay

#### Procastronaut

**Q.** What as-yet-unknown features will appear in the Mac of 2020?

**A.** The Big Announcement at Expo 2020 will be new

time-warp advice software called HindSight 2020. It will tell you now what you'll regret later.

**Q.** What changes do you foresee for MacAddict in 2020?

**A.** Our crack staff of more than 200 seasoned professionals will create a daily dose of 3D holographic wonderment that will beam from your iPad and hover before your eyes.



### Leslie Brown

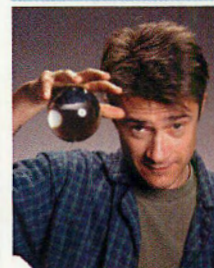
#### Lady Font-leroy

**Q.** What as-yet-unknown features will appear in the Mac of 2020?

**A.** 20/20's getting a Mac? Rock on, Barbara Walters!

**Q.** What changes do you foresee for MacAddict in 2020?

**A.** Apart from rivaling *Modern Bride* in sheer bulk, we'll have a giant art army over which I will rule! Bwah-ha-ha!



### Niko Coucouvanis

#### Mr. Demeanor

**Q.** What as-yet-unknown features will appear in the Mac of 2020?

**A.** Moore's law says that by 2020, desktop

computers as we know them will be replaced with brain implants. Apple will take the "i" thing all the way with the iMac 2020: a full brain transplant.

**Q.** What changes do you foresee for MacAddict in 2020?

**A.** Keeping up with the times, *MacAddict*, like all forward-thinking rags, will be distributed electronically (wirelessly, of course). The information will flow right into your cerebral cortex and you'll just *know*.





# When did it start for you?

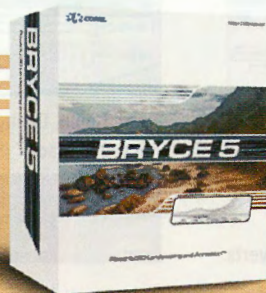


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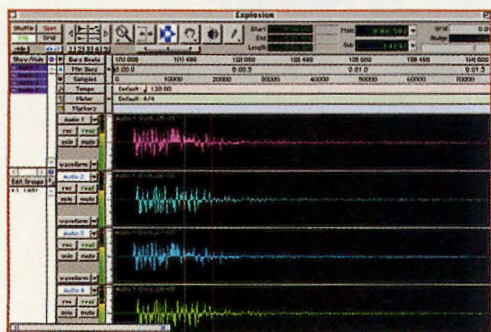


## Exclusive!

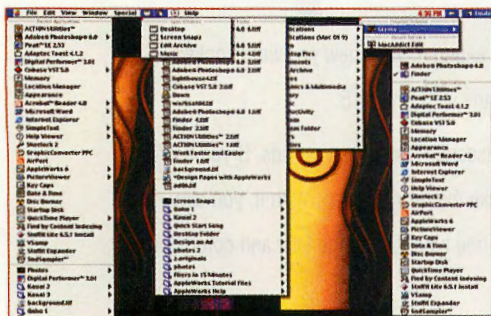
Lineage comes to the Mac—and to the Disc.  
Plus: pro music, productivity, and pizzazz.



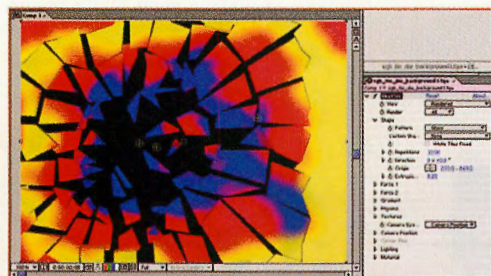
**Lineage:** With 4 million players, this online game puts the “massive” in massively multiplayer RPGs.



**Pro Tools 5.0.1:** Find out why professional musicians agree that with a Mac and Pro Tools, you can do anything.



**ACTION Menus 1.0.3:** You'll wonder how you ever got along without this versatile menu-creation app.



**After Effects 5.5:** This effects app has a great rep among pros—and the latest version will win more converts.



## Lineage Full Version

Lineage, the world's largest online game—with 4 million players worldwide—is finally here for Mac OS X. We've got the full 380MB installer file exclusively on the Disc. This massively multiplayer RPG lets you interact with other Lineage players around the world as you explore fantasy lands, meet fellow travelers and kick their asses, discover ancient ruins, slay dragons, cast spells, and become the ruler of your own domain.



## Pro Tools 5.0.1 Full Version

Listen up, all you musicians and aspiring musicians. This is the real deal: a full version of Pro Tools software. Pro Tools is the industry-standard digital-audio recording, editing, and processing app, and this version allows you to record multitrack audio on your Mac without a Pro Tools hardware system. You can record up to 8 audio tracks, sequence up to 48 MIDI tracks, and process it all with a slew of plug-in effects (contingent on your Mac's processor speed and RAM, of course).



## ACTION Menus 1.0.3 Full Version

What a lucky reader you are! This month we're giving you the full version of ACTION Menus (just make sure you read the enclosed “Get It for Free!” document before May 31, 2002). Create custom menus that launch or quit your applications all at once, open and close documents, get file info, launch URLs, list open windows, and even set your own key-command shortcuts in just about any Classic app.



## After Effects 5.5 Tryout

Add pizzazz to film, video, multimedia, and the Web with this powerful motion-graphics and visual-effects package that enables you to create complex special effects, sophisticated graphic animations, and more. You can animate Photoshop layers and Illustrator art in 3D space. The latest version adds native support for Mac OS X, Colored Shadows and Projection layers, eight new effects, an advanced 3D renderer, adjustment lights, an effects palette, and more.



**Trent, Robin, Danny, Charlie, Jerome, cameras, mics, and Macs.**

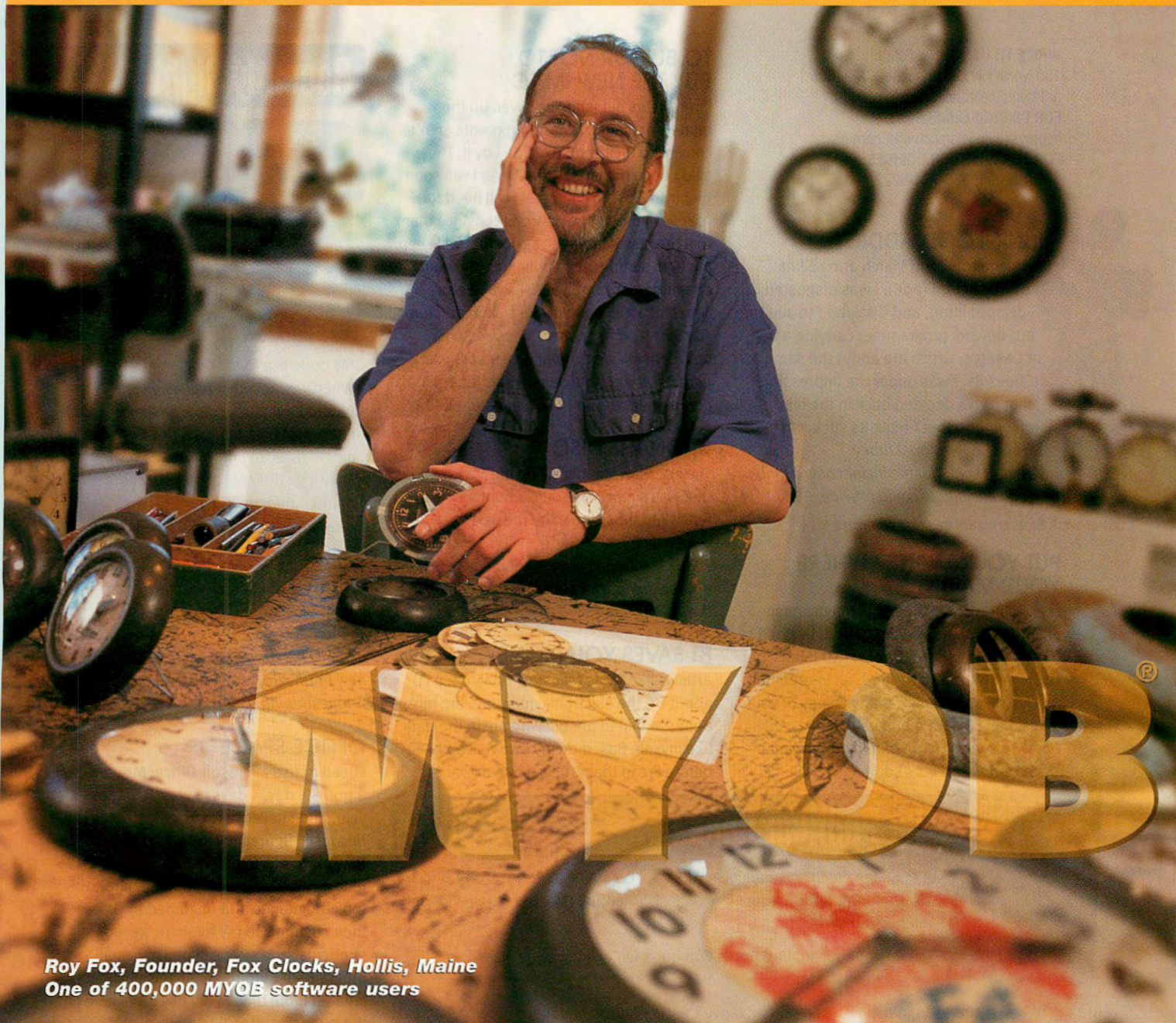
**Extras!** Rock out to some cool tunes: Cheap Trick's in the *MacAddict* Tour music box this month, along with three other great Mac-supporting artists. Or curl up with one of five electronic books, including *Dracula*, *Heart of Darkness*, and *War of the Worlds*.

This month, Nine Inch Nails' front man Trent Reznor becomes an honorary *MacAddict* staffer—our staff video is a trailer he produced for the movie *And All That Could Have Been*. Live concert footage and behind-the-scenes peeks were captured using DV cameras, and edited and mixed on Macs with Final Cut Pro and Pro Tools.

If you don't receive the Disc with your copy of *MacAddict*, you might want to consider upgrading! Each monthly Disc contains cool demos, useful shareware and freeware, and the inimitable *MacAddict* staff video. To get 12 issues of *MacAddict* that include this value-packed Disc with your subscription (prorated if necessary) for just \$10 more, call 888-771-6222—the operator will take care of everything.



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# Letters

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## JUNK-FOOD ADDICT

While reading the March 2002 *Shut Down* section (p96), I was disgusted, disappointed, and disturbed to see the out-of-work programmer carrying a bag of Cheetos, which are about the same as Cheez-Its. I was under the impression that it was decided back in the last millennium that Cheez-Its suck and Fritos rule!—*Mark Kibbey*  
*Mark, thanks for the insight only a junk-food aficionado could provide.*—Ed.

**Out-of-work programmers can't be choosers.**

## PUT YOUR MONEY WHERE YOUR MAG IS

I can't afford your "free gift" magazines anymore. Over a two-year period, I've had to purchase three PowerBooks, two iMacs, one G4 Power Mac, and an iPod, all in order to receive these complimentary issues of your magazine. I'm going broke!—*Glen*  
*Uh, who's going to fill him in on the yearly subscription secret?*—Ed.



## The Political Remix

**W**hen electronic musician BT said, "Let's face it: PCs are Republican computers," in our "Mac Maestro" feature (Mar/02, p31), a lot of you begged to differ.

"I vote Republican, and Apple Computer isn't giving away Macs."  
—*Gretchen Wieshuber*

"When it comes to Macintosh computing, leave the cheesiness of politics out of it."  
—*Ed Beach*

"I would just like to commend you on your lack of fear about expressing opinion in the magazine. Freedom of speech rules, even if it offends some of those oversensitive types."—*Patrick Glenn*

"BT is wrong. Republicans and Democrats are two sides of the same coin. The Mac is a Libertarian computer."—*Curtis Gropp*

"Tell BT he can kiss my Mac-using, conservative Republican ass!"—*Randy Karg*

"Macs are not Democrats. They are about freedom from the oppression of the Wintel regime."—*Michael Gibbs*

## TO BUY OR NOT TO BUY THE NEW IMAC

I'm 14 years old, and I've saved up the money for the new iMac. My parents aren't convinced they should let me buy it. They said I need the money for the car I will soon be buying, or the computer I will need for college in five years. How do I convince them that the new iMac is the savior that will keep me from setting fire to buildings and going on murderous rampages?—*Aron Weiss*  
*Now that we've printed your crazy ultimatum, you'll be a prime suspect for any arsons and/or homicides in your area unless your parents let you get the new iMac. (Check out our review of the new iMac on p46).*—Ed.

## BT ON THE DISC

The interview video of BT on the March 2002 Disc was simply awesome. Count on me to renew my subscription for the next 75 years.—*Jeff*  
*Thank MacAddict contributing editor Andrew Tokuda for shooting and editing the video.*—Ed.

## BT SAVES YOU MONEY

Articles like "Mac Maestro" (Mar/02, p31) about BT, the electronic musician, are rare but essential to people who are in the dark like myself. Based on my own research before I read that article, I had a goal of

## Recently Sighted



My dude is a Mac addict from way back. When we moved into our house, we painted our garage door to make it look like a System 7 desktop. I guess my dude made quite an impression on my parents. They love their Macs so much, they painted their garage door as well.  
—*Lemon James*

\$8,000 to save up before I could even get started creating music, but now I can get going!—*Joe Manning III*

*To our advertisers: This man is lying. We actually told him to purchase \$80,000 of new hardware, which he did instantly and unquestioningly.*—Ed.

## OFFICE SPACE

I used to use Microsoft Office: Mac 2001 for 8 hours a day, 5 days a week, 50 weeks a year, and I never customized a darned thing because I figured my job was too mundane to warrant any fancy shenanigans. After reading "Office Tricks" (Mar/02, p38), I took the plunge and upgraded to Office v. X, then customized my toolbars, keyboard shortcuts, and even ditched my email program for Entourage. All this efficiency created more time in my day for talking on the phone, surfing the Internet, and going home early. Thanks.—*Kristina Flug*  
*We're glad we enriched your lifestyle.*—Ed.

## L'AMOUR FOR SURE

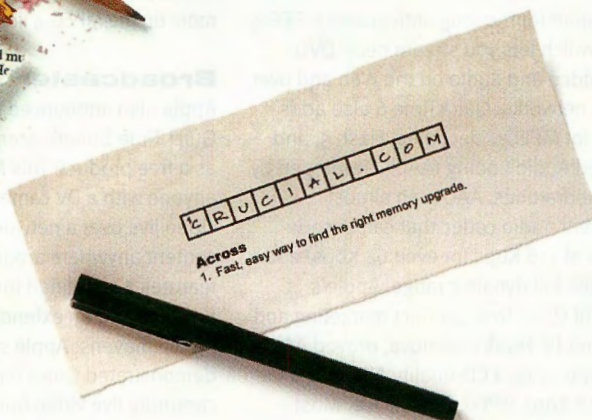
My better half has given me the gift that will keep on giving throughout the year. Yes, she gave me a one-year subscription to *MacAddict* as a Valentine's Day present. Now I know she really loves me!—*Louis Gaulin*  
*And she didn't even have to spend two months' salary.*—Ed.





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## Full Stream Ahead

### Apple Announces QuickTime 6 and QuickTime Broadcaster

**T**alk about a one-two sucker punch. Apple kicked off its annual QuickTime Live event in Los Angeles by first unveiling QuickTime 6 and QuickTime Broadcaster and then saying we can't have them yet.

#### Six in the City

Apple's senior vice president of worldwide product marketing, Phil Schiller, delivered the keynote and demonstrated QuickTime 6 with support for the long anticipated MPEG-4 format, which lets you stream near-DVD-quality video and audio on the Web and over wireless networks. QuickTime 6 also adds support for MPEG-2 decoding, Flash 5, and Advanced Audio Coding (AAC). Developed by Dolby Laboratories, AAC is an almost transparent audio codec that can encode AIFF files at 128 Kbps (or even 64 Kbps) and retain their full dynamic range. Apple's director of QuickTime product marketing and QuickTime TV, Frank Casanova, proved AAC's merits by playing a CD-quality AIFF music file and a 128-Kbps MPEG-4 music file. Most listeners couldn't tell the difference.

QuickTime is gaining greater market share in the multimedia industries. According to Apple, the majority of all enhanced music CDs are made using QuickTime, and Schiller says 251,800 video sites store or stream QuickTime (MOV) content, which is more than the 57,400 sites that display Windows Media (ASF) content and the 109,100 that display Real Media (RAM) content.

While you can look at QuickTime 6, you can't touch it for now. Apple says it can't release QuickTime 6 until it reaches a licensing agreement with the MPEG LA, a consortium of 18 companies that have dibs

Apple's Phil Schiller unveils QuickTime 6 and QuickTime Broadcaster.

on the technology (see "LA LA Land," right, for more on the MPEG-4 licensing controversy).

#### Broadcaster News

Apple also announced the exciting QuickTime Broadcaster, which it will release as a free product. This Mac OS X app allows anyone with a DV camera to broadcast video live over a network and to stream content anywhere around the world. It features a simplified look for multimedia newbies and an extended interface for media mavens. Apple spokespersons demonstrated QuickTime Broadcaster by capturing live video from a DV camera into a TiBook housing Broadcaster. They then broadcast the signal via AirPort to a server, and finally displayed the stream on a wired Mac and a wireless TiBook onstage with only a 3-second delay (for the record, this crashed after about a minute, but we're sure Apple will work out the bugs before the final release). QuickTime Broadcaster supports MPEG-4, all other QuickTime codecs, FireWire capture, unicast and multicast, AppleScript, and more. Unfortunately, QuickTime Broadcaster is embroiled in the same MPEG-4 licensing conflict as QuickTime 6, leaving both products dangling out of reach in front of our aching, bloody noses.—Kris Fong



PHOTOGRAPH BY KRIS FONG

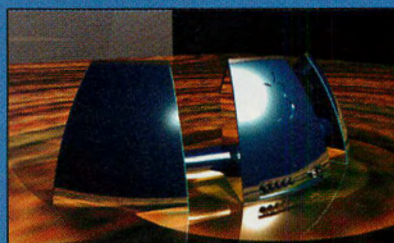
## LA LA Land

**M**PEG-4 streaming technology isn't new. Many companies have been ready to ship it for awhile, and we first reported on it in our July 2001 issue ("The Magical Mystery MPEG-4," p17). However, you can't use it until the MPEG LA—a group of 18 companies with MPEG-4 patents—and developers who use MPEG technology in their apps and devices agree on licensing fees.

Right now, Apple has graciously agreed to pay the 25 cents per distributed decoder and encoder (with a \$1 million cap per year for each decoder and encoder) that the MPEG LA is charging for MPEG-4. What's in dispute is a second fee for content. As of press time, the MPEG folks want to charge 2 cents per hour to every streaming host and 2 cents per hour to every streaming file downloader. Apple and the video industry say no. Apple suggests writing a constructive letter to the MPEG LA (licensing@mpegla.com) courteously protesting the content portion of the licensing fee. We couldn't agree more, so start writing.

MAC TO THE  
**FUTURE**

Our "Future of the Mac" feature story (this issue, p22) made us wonder what tomorrow's technology would look like. As reported in *Wired News*, Advanced Computer Modeling students at the Rochester Institute of Technology were also contemplating that question. Using 3D graphics apps like Alias Studio (on SGI) and Cinema 4D, they crafted their visions of future Apple hardware.



Jared Grodnitzky designed the iSee, a holographic projector capable of imaging 3D objects through telescoping arms that house three adjustable projectors.



# You Game. You Win.

## The Winners of the Spectacular Mac Gaming Contest

In conjunction with our January 2002 games issue, we gave away more than 50 games to the people who most creatively impersonated their favorite game characters. Here are the winners.—NR

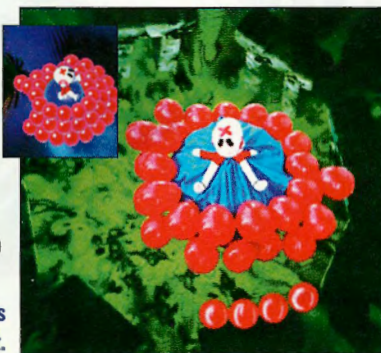


### Gold Medal Winner

**Matthew Leonard Superdock, Age 14**

**Who's he impersonating?** Flux from AirBurst (Strange Flavour, [www.strange flavour.com](http://www.strange flavour.com), \$5)  
**What did he win?** 30 Mac games

Shrunkened and digitally superimposed, Matt (right) becomes a dead ringer for the character Flux (inset) in AirBurst.



So what went into Matt's costume, you ask?



Matt shaves his head.



Matt starts looking like a mime.



Six friends stuff Matt into a beanbag chair.



Matt sprouts arms and legs (taken from an old doll).



### Silver Medal Winner

**Samantha Lynn, Age 31**

**Who's she impersonating?**

Maniacal driver from Carmageddon (Interplay, [www.interplay.com](http://www.interplay.com), discontinued)

**What did she win?** 15 Mac games



The original inspiration was Apple II's Car Wars.



### Bronze Medal Winner

**Kevin McArthur, Age 11**

**Who's he impersonating?** The Ranger from Pillars of Garendall (Ambrosia Software, [www.ambrosiasw.com](http://www.ambrosiasw.com), \$25)

**What did he win?** 5 Mac games



It took Kevin's brother five weeks to make this costume.

## Honorable Mention



**Joseph W. Schwartz, Age 10**  
 Ferazel from Ferazel's Wand (Ambrosia Software, [www.ambrosiasw.com](http://www.ambrosiasw.com), \$30)



**Amanda Gail Storm, Age 23**  
 Lara Croft from the Tomb Raider series (Aspyr Media, [www.aspyr.com](http://www.aspyr.com), \$19.95)



**Michel Boissonneault, Age 39**  
 Harry and friends from Harry Potter and the Sorcerer's Stone (Aspyr Media, [www.aspyr.com](http://www.aspyr.com), \$29.95)

**Concept:** MiniTower with LCD

**Artist:** David L. Schafer

Schafer designed this G3 tower successor to resemble a train. Why a train? "To give the impression of speed," he explains. These days a G3 is hardly cutting-edge, but add one of those fabled G5 processors and you'll be doing the locomotive.



This futuristic PowerPC is built for speed.

**Concept:** iPod II

**Artist:** Sani Seesuchart

Seesuchart's side grip makes the new iPod easier to hold and contains the iPod's control buttons, minimizing the need for finger movement.



This wavy iPod adds better finger management to the mix.

## newsNOOK

### Open Source Streaming

Apple announced QuickTime Streaming Server 4, which allows multimedia content distributors to stream MPEG-4 and MP3 audio content almost flawlessly. Unlike QuickTime 6 (see "Full Stream Ahead," p14), QuickTime Streaming Server 4 is available today free at Apple's Open Source Projects ([www.opensource.apple.com/projects/streaming](http://www.opensource.apple.com/projects/streaming)).

### Here Comes the Sun

At Apple's QuickTime Live conference, Apple, Sun, and Ericsson announced a partnership to bring streaming video to cell phones and PDAs. Sun Microsystems demonstrated how to export MPEG-4 video from Apple's Final Cut Pro, drop it onto a Sun streaming server, and deliver content to computers and television screens. We're assuming Ericsson will provide the phones. Sun and Apple are cofounders of the Internet Streaming Media Alliance for developing interoperable standards-based technologies and gadgets. See the Sun Streaming Technology Web page ([www.sun.com/wireless/streaming](http://www.sun.com/wireless/streaming)) for more information.

### QuickTime Gets Real

Apple announced that in the year 2001 QuickTime beat out RealNetworks in the "How many new users did you get?" contest. Apple says 80 million new users downloaded the QuickTime Player, while only 75 million downloaded RealOne and RealPlayer combined.

### Apple Wins a Grammy

Apple took home the 2002 technical Grammy award for "bringing computer technology into the studio and revolutionizing the way music is written, produced, mixed, recorded, and creatively imagined." (We would never dare paraphrase the Academy.)

### In with the Old

The desktop computer market may have tanked last year, but the market for peripherals stayed afloat. According to NPD Techworld's survey, the market for LCD monitors rose 262 percent, the market for external hard drives rose 182 percent, the market for RAM rose 150 percent, and the market for network access points (like hubs and routers) rose 128.3 percent.



get info

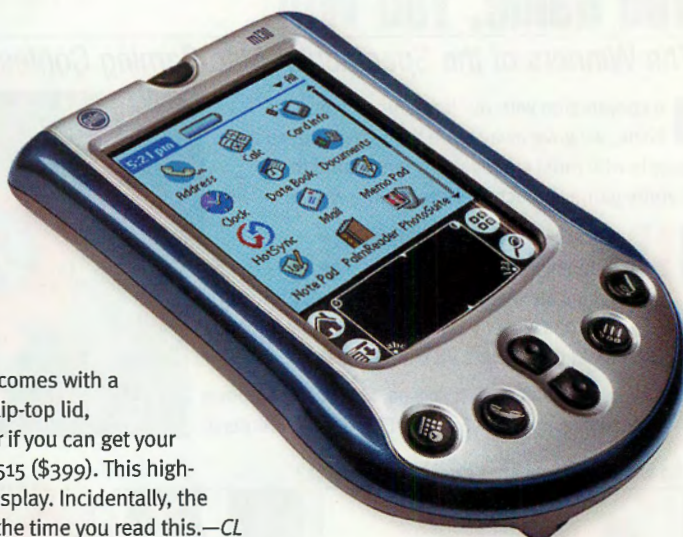
# droolWORTHY

Sexy Stuff We Can't Wait to Get Our Mitts On

## Palm m130

Palm [www.palm.com](http://www.palm.com) \$279

**H**ere's a color handheld device you can afford. The new m130 comes with a 16-bit color display, a rechargeable battery, a USB cradle, a flip-top lid, swappable faceplates, and an SD card slot. If money is no object or if you can get your employer to cough up the dough, you should opt for the all-new m515 (\$399). This high-end, slim PDA has 16MB of memory and a brighter, active-matrix display. Incidentally, the final version of Palm Desktop for Mac OS X should be available by the time you read this.—CL



PHOTOGRAPH COURTESY OF PALM

It's small, it's color, and it's affordable—what more do you want?



This digital camera went on a diet.

## FinePix 30i

Fujifilm [www.fujifilm.com](http://www.fujifilm.com) \$399

**A**w, how cute. The FinePix 30i by Fujifilm packs a 2.1-megapixel digital camera, an MP3 player, digital voice annotation, and AVI video support into one cute 5.6-ounce device. A remote control scrolls through photos and MP3s stored on the included 16MB SmartMedia. At \$399, we'd like more than a 2.5X digital zoom, but it's so adorable we just can't resist. The FinePix 30i should be available in the United States by the time you read this.—Whitney Hess

PHOTOGRAPH COURTESY OF FUJIFILM

## Shareware Pick of the Month

### PocketNotes

Price: \$20  
URL: [www.pocketsw.com](http://www.pocketsw.com)

**P**ocketNotes is one serious notepad. Create tabs to categorize your notes. Use the Outliner Panel to organize your topics hierarchically. Store email and Web links with the Link Shelf, and fire up files, folders, and applications with a single click. You can customize the toolbar, and PocketNotes supports skins, so it's personalized as well as productive. If that's not enough, the program also includes password protection, priorities, reminders, and unlimited undos.—Andrew Tokuda



PocketNotes is a notepad on steroids, taming your wild clutter of notes.



Customize PocketNotes' toolbar until it reflects the real you.

MAC TO THE  
FUTURE

**Concept:** Apple MP3 Player  
**Artist:** Hung-Chih Wang  
This wireless MP3 player is easy to tote along. The player itself (including the memory and battery) is built into the earphone, so users don't have to carry an extra piece of hardware. And they can control the player wirelessly through a remote control in the form of a watch.



Joggers rejoice. A wireless remote, worn as a watch, controls this MP3 player and headset.



# Jumping Jack Flash

The New Flash MX Supports Video

Macromedia ditched the number system and called the new version of its multimedia-authoring tool Flash MX. Perhaps the biggest change to Flash is its new support for video through the adoption of Sorenson Spark technology (see "New Stuff," right). Flash MX includes Sorenson's Spark codec. Video support makes Macromedia's new Flash 6 player a viable alternative to QuickTime, Real, and Windows Media players for viewing short movie clips. Flash MX can import MPEG, DV (digital video), MOV (QuickTime), and AVI formats. It can also scale, rotate, mask, and animate video objects.

Flash MX offers a host of other tools, including industry-standard Bézier drawing tools and a Free Transform tool for scaling, rotating, and skewing objects. Pixel Snapping allows precise placement of objects, and Macromedia has enhanced Flash's color mixer.

Flash MX comes with new workspace-optimization features like collapsible, Dockable panels, a better timeline with Layers folders for collapsing nested layers, and a Property Inspector (borrowed from Dreamweaver) whose settings change to reflect the selected tools and objects. And for application developers, Macromedia has enhanced the code debugger and ActionScript Editor. Flash MX should be available by midyear 2002 for \$499.—NR



Video support makes Flash MX an alternative to Real and QuickTime.

## Bluetooth Fairies

PDAs and Printers Further Device-to-Device Communication

Do you remember Bluetooth? This wireless technology was supposed to change the way devices like cell phones, printers, and PDAs communicate. We've heard much talk but seen little action—until now.

Palm is now shipping a Bluetooth card that slips into the SD slot of your Palm handheld. The card (\$129, [www.palm.com](http://www.palm.com)) ships with several apps, including one that allows you to dial your Bluetooth-enabled cell phone from your Palm's address book, as well as another app that allows two people with Bluetooth-enabled PDAs to chat. Perhaps the coolest use for one of these puppies is Blueboard, an app that lets you and a fellow Bluetooth collaborator on text or graphics documents. Anything you write or draw on your Palm's screen appears on your cohort's screen—like a virtual whiteboard.

Epson unveiled a Bluetooth Print Adapter (\$129, [www.epson.com](http://www.epson.com)), which lets Bluetooth-enabled Palm devices print to the Epson C80 color inkjet printer via a Palm .PRC application called IS/Complete's BtPrint (free with Epson's adapter, [www.btprint.com](http://www.btprint.com)). A \$14.95 upgrade lets you print from DataViz's Documents To Go.—CL



Epson's Bluetooth Adapter lets Palm users print to the Epson C80 color inkjet printer.

Concept: iSee

Artist: Yuhay-Raymond Ng

The futuristic and fashionable iSee is a combination global positioning system and mobile phone that shows worldwide political boundaries, U.S. cities, highways, major roads, national parks, waterways, and railways. You can upload location data from your Mac via USB. I see everything with iSee.



Concept: iPod

Artist: Maureen Lin

Lin goes retro, bringing old iMac fruit flavors (remember those?) to the iPod. She goes back to the future, however, with a smoother shape that fits more easily in users' pockets.



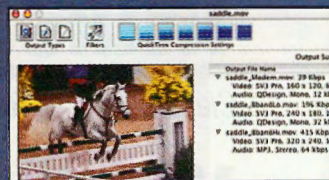
Viva fruit flavors.

## new STUFF

### Sorenson Squeeze for Macromedia Flash MX

Sorenson, [www.sorenson.com](http://www.sorenson.com), \$299

The latest pro version of Sorenson's video-compression and -streaming software supports Flash MX (see "Jumping Jack Flash," left). Squeeze includes a new video codec called Spark Pro. This product should be available by the time you read this.



Squeeze Flash MX video.

### Canon Bubble Jet Printers

Canon, [www.usa.canon.com](http://www.usa.canon.com), \$499 (\$9000), \$399 (\$900), \$299 (\$820)

Canon released a slew of new inkjet printers. The S9000 Color Bubble Jet Photo Printer prints sizes up to 13 by 19 inches at a maximum resolution of 2,400 by 1,200 dpi. The S900 and S820 Color Bubble Jet Photo Printers print standard paper sizes at a maximum resolution of 2,400 by 2,400 dpi.

### Sony CRT Displays

Sony, [www.sony.com/displays](http://www.sony.com/displays), \$250 (CPD-E240), \$600 (CPD-E540)

Sony released the 17-inch CPD-E240 CRT display, which has a maximum resolution of 1,280 by 1,024 dpi, and the 21-inch CPD-E540 CRT display, which has a maximum resolution of 1,920 by 1,440.

### Musicmatch Jukebox Plus 3.0 for Mac

Musicmatch, [www.musicmatch.com](http://www.musicmatch.com), \$19.99

This new version of Jukebox (available now) lets you play, burn, record, and organize your music, as well as convert it to MP3.

### Mercury On-the-Go 60GB FireWire drive

Other World Computing, [www.macsales.com](http://www.macsales.com), \$639.97

This 60GB, 2.5-inch portable FireWire drive (available now) weighs in at a mere 11 ounces. It offers an Oxford 911 chip set and a 60GB IBM Travelstar drive.



Get this drive to go.

### 60GB FireWire drives

Trans Intl, [www.transintl.com](http://www.transintl.com), \$479 (internal), \$579 (external)

The 2.5-inch 60GB internal IDE drive is for PowerBooks only. Trans Intl also offers a 60GB external FireWire version, enabled by an Oxford 911 FireWire-to-IDE bridge chip. Both drives are available now.



# INtheSTUDIO with J.J. Tindall

## Classic Rocker Records Acoustic Music Digitally

**V**eteran recording artist J. J. Tindall has recorded, mixed, and distributed his own classic-rock records for nearly 20 years. He produced his latest album, *Songs in the Rock Genre*, using a Power Mac G3, Emagic's Logic Audio Gold sound-editing software (\$499 street, [www.emagic.de](http://www.emagic.de)), a mixing board, and a whole lot of microphones. Tindall told us how he uses his Mac to make music, recording a rich spectrum of sounds from his electric and acoustic instruments. —Keelin Devincenzi

### The All-Important Mic

Tindall set up elaborate microphone configurations when recording *Songs in the Rock Genre*. Just to record drums, for instance, he used five microphones: an AKG Acoustics D112 (\$179, [www.ake-acoustics.com](http://www.ake-acoustics.com)) in front of the bass drum, a Shure SM57 (\$146, [www.shure.com](http://www.shure.com)) on top of the snare drum, another Shure SM57 on top of the floor-tom drum, and two AKG C1000s (\$299) in front of and above the drum kit to the left and right to capture the room sound. Laying guitar tracks was no less elaborate. He plugged his old Martin STX Stinger electric guitar into a Fender Champ amplifier with vacuum tubes. He then set up one mic in front of the amp, another behind the amp, and still a third 6 feet back to get the room sound. When recording an upright piano, he used three mics—one to

the left, one to the right, and one 6 feet back—to capture the room sound. "You can tweak to the 1,000th degree using Logic [Gold audio software], but you still need a really good setup," Tindall says.

### The Mac Setup

Tindall still uses his 300MHz Power Mac G3 running Mac OS 8.6, although he boosted his RAM to 256MB and bought a Yamaha CRW 4416 drive (\$469, [www.yamaha.com](http://www.yamaha.com)) for burning master discs and making backups. He connects the mics to a Mackie Designs 1604-VLZ Pro mixing board with premium XDR mic preamplifiers (\$999, [www.mackie.com](http://www.mackie.com)), and the mixing board plugs into a Mark of the Unicorn 2408 digital interface (\$995, [www.motu.com](http://www.motu.com)). The MOTU breakout box connects to the Mac through the bundled PCI-324 sound card. "PCs are fine for word processing and household accounting, but when it comes to state-of-the-art multimedia, Macs are really the only option," Tindall says.

### Using His Logic

Tindall used Logic Audio Gold for recording, editing, mixing, and mastering each track on the album. Logic has 50 different plug-ins, and Tindall specifically recommends using echo, equalization, compression, and reverb for maintaining the warmth of acoustic music. To



His logic's not electronic. Tindall uses Logic Audio and a Power Mac G3 to record classic rock.



Tindall's small-room setup can record big-room sound.

add an effect in Logic Audio Gold, you click the audio-mixer icon to bring up the virtual mixer, then select the plug-in you want to use. You can add up to three effects on each track, but that boosts the file size. Tindall uses a technique called *busing* to combat this expansion of girth. He puts, say, an echo effect on one track and uses the mixing board to reroute the individual instruments to that track; this allows him to use lots of effects without increasing the file size. Tindall's songs still get quite large, however. An average 24-track song can be as large as 700MB.

"If you know what sound you want in your head, it's amazing how precisely you can create it in Logic," Tindall says. "It is absolutely the best way to make custom sounds on a limited budget with limited space." Tindall spent one month writing, recording, and producing each song on *Songs in the Rock Genre*, which is available at [www.jjtindall.com](http://www.jjtindall.com). His music is also available at [www.amazon.com](http://www.amazon.com).



Tindall used Logic Audio's GoldVerb (reverb) plug-in on the overhead drum mics to provide a sense of space and depth.

## MAC TO THE FUTURE

**Concept:** Apple iPod II  
**Artist:** Joo-Hyeon Kim  
Kim designed a foldable iPod to protect the LCD panel and to make the iPod resemble a personal book (like a diary).



Dear iPod, today I downloaded free MP3s. Don't tell.

**Concept:** iMac  
**Artist:** Michael Ienna  
To Ienna, the iMac represents the future and the possibilities of design, so his prototype suggests not only an unknown future but also a desire to go there.



This iMac could double as a spaceship.



# BEACH HEAD 2002



**DEFEND. DESTROY. PLAY THROUGH THE NIGHT!**



Blood  
Violence



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INFOGRAMES  
**MacSoft**



# scrapbook

Learn what's on the inside without voiding your warranty.

## Audio Ins and Outs

by Keelin Devincenzi



Find the full version of Pro Tools 5.0.1 on the Disc.

**W**hether it's old (with 1/8-inch audio-in and/or a serial port) or new (with USB ports), here's what you'll need to bring music to your Mac. Don't forget that you'll need Mac OS 9.0.4 or later

for USB Audio support, and you'll also need an audio-capture program like like Digidesign's Pro Tools (on the Disc), which lets you edit and mix audio.

### Older Macs

If your turntable hooks up to a stereo receiver, connect an RCA-to-1/8-inch stereo cable between the receiver's tape out or aux out and the Mac's 1/8-inch audio-in jack. If there's no receiver, get a phono preamplifier like RCA's AH500 (\$29.95, [www.rca.com](http://www.rca.com)). An RCA stereo cable connects the turntable outs to the preamp ins. An RCA-to-1/8-inch cable joins the preamp to the Mac.

A microphone with a 1/8-inch miniplug fits into your Mac's audio in. A mic with a 1/4-inch plug requires a 1/4-inch female-to-1/8-inch male adapter. A mic with a professional XLR connection requires an additional XLR-female-to-1/4-inch male adapter, such as Shure's A95UF Line Matching Transformer (\$42.17 SRP, [www.shure.com](http://www.shure.com)). The more adapters you use, however, the more likely you'll lose sound quality.



Plug an electric instrument like a keyboard or guitar into your Mac's audio-in port using a 1/4-inch-to-1/8-inch cable. Some instruments have two (left and right) 1/4-inch stereo outputs, so use a miniplug cable that connects dual 1/4-inch to single 1/8-inch stereo.

Invest in a mixer like Midiman's MultiMixer 6 with six input jacks (\$99.95, [www.midiman.com](http://www.midiman.com)).

Plug your instruments and mics into the mixer's 1/4-inch jacks, and connect the mixer to your Mac's audio-in port with a dual (left and right) 1/4-inch-to-1/8-inch stereo cable.



MIDI instruments transmit no sound to the computer, just digital information. To connect a MIDI instrument to a Mac with serial ports, use a serial-based MIDI interface box, such as Midiman's Macman (\$59.95).



### Input



### Vinyl



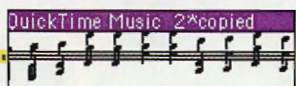
### Voice



### Electric Instruments



### Multiple Instruments



### MIDI

### Newer Macs

Connect your stereo receiver or preamp to a USB-to-audio adapter such as Griffin Technology's iMic (\$35, [www.griffintechology.com](http://www.griffintechology.com)) using an RCA-to-1/8-inch stereo cable. Connect the iMic to your Mac via the USB port.



Plug your 1/8-inch miniplug mic into the Griffin iMic, which then connects to your USB port. For 1/4-inch and XLR microphones, check out Edirol's UA-3 USB Audio Interface (\$179, [www.edirol.com](http://www.edirol.com)) with 1/4-inch stereo jack and RCA line inputs and outputs.



The cheap solution is to plug your instrument into Griffin iMic's 1/8-inch miniplug jack with a dual 1/4-inch-to-1/8-inch stereo cable. Then plug the iMic into your Mac's USB port. You can also use a 1/4-inch cable to plug your instrument directly into the UA-3 USB Audio Interface (see above). Both solutions give you 44.1KHz, 16-bit CD-quality audio.

If you need more than the one input on Griffin Technology's iMic, get a mixer. Plug its stereo outputs into the iMic using a dual 1/4-inch or RCA-to-1/8-inch stereo cable. If you've got more cash, check out Digidesign's Mbox USB audio interface (\$495, [www.digidesign.com](http://www.digidesign.com))—see p59 for our Mbox review.

Use a USB MIDI interface box, such as the Midisport 4X4 USB MIDI Interface from Midiman (\$199.95).



## Professional Recording With a Sound Card

If you need to record audio that's better than CD-quality and/or you need multiple audio inputs, invest in a sound card plus a breakout box that houses multiple audio ins and outs. Mark of the Unicorn's PCI-324 card plus its 2408 MKII box (\$995 total, [www.motu.com](http://www.motu.com)) is one option. Connect

your instruments to the breakout box, then connect the breakout box to your sound card. If you have FireWire, the MOTU 828 (\$795, [www.motu.com](http://www.motu.com)) external FireWire recording system eliminates the need to install a sound card.





# personals

like ships  
passing in  
the night

**SUPERMARTIN** Not older gal with Spin... working at WFM. Me: 23, open to possibilities and ravenous for new life experiences. #6922

**COO** I did not get... beautiful. I would... Did I read

**PHONE-PLAYING** Smithville recently Georgia. #6854

**WE MET IN MADISON** Summer. Would like to talk again! #6967

**FROM WCW** Exchanged... at cage match. It was pure... Would love to get you in a... #5627

**BEAUTIFUL AND SEVENTEEN** Met you at the Metro. You were on a date with someone else. Next time it will be me. #6973

**LEVITATING BUDDHA SWORD** Met you at the Metro. You were on a date with someone else. Next time it will be me. #6973

**VEGETARIAN BOWLER** You bought me a warm beer and stole my heart. Used same kind of ball and spoke of hatred of rented shoes. Would love to chat over hummus. #5684

**LAWN CARE?** My husband got lazy and hired you to mow our lawn. Instead you landscaped my erotic fantasies in ways I have never imagined. Could not pronounce your name but looked very sensual. I had blue shoes on. #3696

**TWINS WHO SAW TWINS** Us: two handsome guys in suspenders walking Maltese. You: two foxy ladies fighting over last piece of gurr. What do you say the four of us make two good looking couples? Twin love. Call me. Call me. #4747

**DUGOUT FIRECRACKER** You were cleaning up a beer that you spilled on your white t-shirt and threw a whiskey bottle at the umpire. Must meet you and make children. #5551

**LORIN, YOU'RE GORGEOUS** funny and brilliant. I don't deserve you but a girl can dream. #6885

**SY FROM DOWN SOUTH** You sat with us at Smitty's 11/24, missed you at The Boot. Wanna meet after work sometime? Call and gimme your number Jenny. #6927

**CLASSY LATINA** With substance, 40 plus, non smoker, very pretty, smart, fun, and caring, intelligent, person who can take care of you. #6927

**RON FROM SANTA FE** You danced with me at the Rattle & Cattle Club. Thanks! I was shy. Can I see you again? Will come down to look for you Friday night. #6841

**GORGEOUS, WITTY, BORN TO TEASE** love theater, dance, golf, warm conversation. If you're tall, 35-55, non-smoker, financially secure, enjoys pampering a woman, traveling, long walks and stars, please call. #6821

**ME: LONELY SWEDISH LINGERIE MODEL** and gourmet cook. You: slightly overweight and without ambition. Must be into computers, role-playing games and air hockey. #5988

**49, PLAIN BUT WITH GOOD BITS** overweight but curvy, great mind, wicked sense of humor, and a weird view of life looking for like minded person. Age not important. #6994

**TREE HUGGER, MID 50'S**, light smoker, tall. Like easy living, tropics and I'm friendly. Seeking considerate, semi-fit companion with a clue. Must love dogs and reggae. #6963

**ARE YOU HONEST**, handsome, successful, financially secure, intelligent, world traveled, cultured, creative, fit, playful, adventurous, passionate, humorous, caring, loving and between 40 and 60? Respond to European, blonde female counterpart. #6853

**ARE YOU STIMULATED BY** beauty, intelligence, humor? Attractive SWF wants good looking SWM or SHM for romantic adventures, possible long term. Essentials: honesty, passion, kindness, sensuality, integrity, open mind. #6741

**ATTRACTIVE TALL (5'10")**, slender DPWF, 46, emotionally and physically fit, youthful appearance and outlook, intelligent, loving, desires long term relationship. #6853

**YOU WON'T BELIEVE YOUR EYES** when you see this very cute, petite, DWF, 46, long brown hair/hazel eyes, 5' 110, outgoing personality seeks DWN, 46-55, non smoker, fit, college educated. Call me, let's see if the chemistry is right! #6951

**SWF, 26, STRAWBERRY CURLS** and tattoos. Craving a complex, enlightened, educated, unpretentious, and fun person. #6927

**NOT SO DESPERATELY** seeking one smart, strange, sexy boy to court and spark. Me: 23, open to possibilities and ravenous for new life experiences. #6933

**SWINGING SANTA** Lonely man who only works 6 weeks a year seeking woman with full time employment with benefits looking to grow old with man who shakes like a bowl full of jelly. #1258

**WM, 95, RECENTLY WIDOWED**, seeking 18-20 hottie for "fun". Call soon. I'm not getting any younger. I'll put you in my will. #6757

**BALD HOME**. You serenaded the old people at the old people home last weekend. You were a terrible singer and quite unattractive, but your heart is obviously pure gold. My sister would be perfect for you. #7867

**MONKEY TRAINER** Seeking woman to train my monkey. Seriously, his name is Murphy and he is a 3 year old chimpanzee. He likes pop larts and nice people. Plus, you and I will have sex. #7874

**SINGLE MAN** Single man seeking single woman for relationship. I enjoy dating and talking on the phone to women that I am dating. Would love a chance to date someone. #1254

**CUTIE BE SMARTY PANTS** 26, seeking any guy for strong, fun, intelligent, and sexy. #6927

**SIDESH** sidesh... well p... for r... an

**T** ha... ing... right... do y... good k... Call me

**MANY WON** my life - but no... wonderful woman, smart, professional, and (non smoker). Love of nature, irreverent humor. #6772

**RECENTLY PAROLED**, looking for a lady who will keep me on the straight and narrow. Must be into drugs and shopping. #6367

**HOPLESS ROMANTIC**, seeks... #6927

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# the Future





# of the Mac

Hint: It's cooler  
than you can  
possibly imagine.

Rewind five years to 1997. Back then, Mac OS X didn't exist. Nobody could conceive of editing home movies on their computers. Few people used Palm Pilots, and MP3 players didn't exist. Only rich people could afford LCD displays.

Fast-forward to the present. We now have not one, but two 1GHz chips in a single Mac. We have a consumer desktop computer that features a floating flat-panel display. People are creating professional movies on Macs. You can sit in your living room surfing the Web wirelessly at speeds that put 56-Kbps modems to shame.

Five years ago, few could have predicted what things would be like now. And now, nobody can predict exactly what things will be like in five years.

But that's not going to stop us from trying.

In the pages that follow, we'll look at the technologies, trends, and consumer demands that will change the Mac over the next five years. Some of these technologies may indeed live up to their hype. And others may end up in tech heaven alongside the Cube and the Newton. We can't infallibly predict what will and won't happen (if we could, don't you think we'd be doing something far more lucrative right now?). But we can tell you what looks promising at this moment in time. And from where we're sitting, the future looks pretty damn sweet.

by Cathy Lu

photograph by Mark Madeo





# The Processor Guessing Game

In late January, Apple reached a major milestone: It finally hit the gigahertz mark by releasing a dual-processor 1GHz G4 Mac. So what's next?

Unfortunately, that question's not as easy to answer as you might think. Ask Apple or Motorola, maker of the PowerPC chip, about plans for the future, and they fall quieter than Ken Lay at a Congressional hearing. What we *can* do, short of bugging Jobs's office (and don't think we haven't thought about that), is examine public documents, analyze technological trends, talk to industry experts, and make predictions based on Apple's past actions.

Of course, the biggest question mark is the G5. According to Motorola's processor road map, it's coming—but when? Some industry insiders are speculating that it might be too optimistic to hope for a G5 this summer or even this year, especially considering that the G4 in the dual-gigahertz Power Mac (the MPC7455) is a newly tweaked processor. As Greg Joswiak, Apple's senior director of hardware product marketing has been quoted as saying, the G4 still has a long life ahead of it.

However, as Peter Glaskowsky, senior editor of *Microprocessor Report*, says, there is some pressure on Apple to deliver the G5 this year. "It wouldn't kill them, but it would hurt them [not to deliver it]," says Glaskowsky. "Despite all of [its] ability to say a G4 at 1GHz is comparable to a P4 at 2GHz, a lot of people still don't buy it." That said, Glaskowsky is one person who thinks Apple might announce a G5 this summer, although he stresses that it's an educated guess. We do, however, know a few things about the mysterious chip, based on Motorola's PowerPC road map, a public document outlining the company's processor strategy. (Note that some Mac Web sites have reported that Apple will be releasing a chip with many of the G5's features and will call it a G4. For the purposes of this article, we'll make assumptions based on Motorola's published road map.)

First off, several important features of the G4 chip will remain in the G5 chip, including AltiVec and support for L3 cache. AltiVec (also referred to as the Velocity Engine) is a vector processor, which means it executes the same operation on many pieces of data at the same time, thus allowing the

chip to perform computations such as MP3 encoding in iTunes and translucency effects in Mac OS X faster. The L3 cache provides quicker access to recently used data, much the way your Internet browser's cache works.

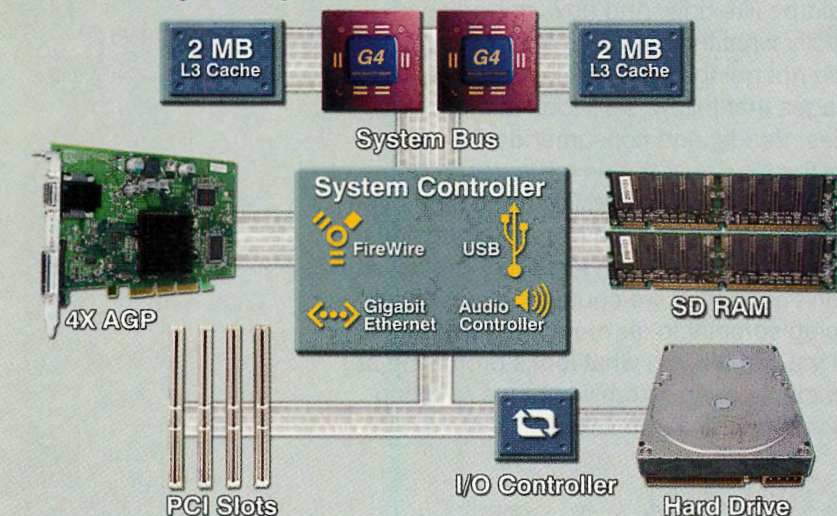
As for the new stuff, the road map indicates that the G5 will feature a new pipeline, RapidIO interconnect, 0.13 micron process with SOI (silicon-on-insulator), and speeds of 800MHz to 2GHz-plus. If you're a processor geek, you're already salivating at the specs. If not, you should be. Here's a quick look at what all of these goodies mean:

**Deeper Pipelines.** When Steve Jobs talks about the megahertz myth, much of what he is referring to comes down to the number of stages per pipeline. Imagine a little boy walking with his mother; the boy may be taking more steps and his legs may be moving faster, but he's not walking any faster than her. Same deal with pipelines. The Pentium 4 divides tasks between more but shorter stages than the G4 does, which allows—and requires—Intel to bump up the clock speed. Still, Motorola is deepening its pipelines—the MPC7455 chip has a seven-



## Info Flow: Inside the Dual-Gigahertz G4

Processor, memory, hard drive, AGP. How do they all work together? Here's a look at how the whole shebang comes together.



SOURCE: APPLE COMPUTER

## Would You Like a Byte?

If you can't tell your left from your right and your bit from your byte, read on for some insight.

Short for binary digit, a *bit* is the smallest unit of information on a computer. A single bit can hold only one of two values: 0 or 1. Programmers typically combine consecutive bits into a larger unit, like a byte. Bits often quantify data-transfer rates. Meanwhile, a *byte*, short for binary term, is a unit of storage capable of holding a single character. A single byte equals 8 bits, although many languages, such as Japanese and Chinese, use double bytes, or 16 bits, to describe one character. Bytes quantify storage capacity and RAM.





Motorola's latest G4 chip, the MPC7455, made a gigahertz breakthrough.

stage pipeline, while the original G4 processor had four stages—and that number is expected to grow in the G5.

**RapidIO Interconnect.** RapidIO refers to the system-bus technology. The system bus is responsible for the transfer of information between the CPU and the system controller, which acts as a traffic light for regulating data flow to the rest of the system, such as the AGP graphics slot, memory, and hard drive (see “Info Flow: Inside the Dual-Gigahertz G4,” p24). The current system-bus speed of the G4 towers is 133MHz. RapidIO interconnect enables system-bus speeds of 250MHz to 1GHz, although Glaskowsky expects the first G5 processors to fall in the 400MHz to 500MHz range. Translation: These babies will fly.

**0.13-Micron Process.** Current G4 processors feature a 0.18-micron process. The G5 will feature a 0.13-micron process. For reference, fine human hair is equal to

approximately 50 microns in diameter. In geek terms, a lower micron process means the transistors on the chip will be smaller, which will make them switch faster and allow Motorola to squeeze them closer together. Smaller process and chip features also mean that Motorola can produce more chips per wafer—if the yields are good (that is, if you get enough chips that are functional and perform up to the desired megahertz standard). To you, this means the chips will be faster and cheaper (again, if the yields are good).

**Silicon-on-Insulator.** Motorola introduced the SOI process to the G4 line with the MPC7455 chip and will continue to use it in the G5. As Glaskowsky explains it, SOI is “a way of putting a layer of insulating material between the silicon wafer and the transistors. This reduces the capacitance [the ability of a substance to store an electric charge] between the transistor and the wafer and allows the transistor to switch faster.”

**High Clock Speeds.** Current G4 chips max out at 1GHz clock speeds (the speed at which the chip's internal clock moves data around). That's nothing to sneeze at, but with clock speeds capable of 2GHz, a G5 Mac should burn through tasks in processor-intensive apps like Photoshop and Final Cut Pro.

>>

## The \$64,000 64-Bit Question

Ever wonder why you can't add more than 1.5GB of RAM to your G4 Power Mac? (If not, and if you think 128MB is rad, just humor us.) The short answer is it's Apple's fault. The long answer is it's the technology's fault.

The PowerPC chip has a 32-bit integer core. That means when you specify an address in memory, you have 32 bits to describe it. Unfortunately, that restricts the total amount of memory you can have in your Mac to 4GB. Furthermore, some of that memory must be reserved for talking to hardware, which further limits the amount of memory available to users. Apple chose to make 1.5GB of memory usable—a decision the company probably made when memory was ridiculously expensive.

The only solution for the long-term memory limit is to employ a true 64-bit chip, which allows for *terabytes* upon *terabytes* of RAM. That's where the PC industry is headed—both AMD and Intel are working on 64-bit solutions, and our sister publication, *Maximum PC*, predicts that it will take one to two years before 64-bit computing becomes a reality in a desktop PC.

Certainly the folks at Motorola also have 64-bit computing in mind. The specs of the G5 chip on Motorola's road map indicate the possibility of a 64-bit product. Apple has not said word one about making a 64-bit version of Mac OS X, but it's no small undertaking. Most operating systems—as well as apps—currently divvy up data in 32-bit chunks. Because of that, it would take years to transition from 32- to 64-bit operating systems—so don't start holding your breath.

## Mac OS X: OS of the Future Interview: Apple

The original Mac OS lasted us a good, long 17 years (some pro musicians would argue it's *still* the superior operating system). So what did Apple have in mind when building its new system for the future? We talked to Ken Bereskin, director of Mac OS product marketing for Apple.

*MA: What were your goals in designing an operating system for the future?*

*KB: At the highest level, Mac OS X was designed to be the platform of the future for us...We wanted to design another operating system that would serve Apple for the next generation, for another 10 or 15 years...The next most important [goal] was to embrace and to drive industry standards. We wanted to make sure the Mac was the most compatible, the most open platform out there...[and] that it would be a platform that would not only have the Mac community excited about doing software development but would also bring into the Apple fold Java developers and Unix developers...The third biggest goal was to deliver truly on what Apple does best—ease of use—and to make using computers as simple and as automatic as possible.*

*MA: What does the fact that Mac OS X is based on Unix mean to consumers?*

*KB: There's a number of great benefits. The system is going to offer just remarkable reliability and stability...On a modern operating system like Mac OS X with Unix underpinnings, if an application fails, it'll stop working, but it won't impact anything else that's going on with your system...Another big one for Mac users is that the Darwin plumbing is really smart at automatically managing memory.*

*MA: Can you explain how Mac OS X supports dual processors?*

*KB: There [are] two terms that often get confused. The first is *multitasking*, and the second is *multithreading*. In the case of multitasking...[Mac OS X is] able to assign the first task to one processor and the other task to the other processor. And they basically operate in parallel, and it's like each application has its own dedicated Power Mac...Multithreading is when you have an application that needs to go as fast as possible...Through specific programming, [a Photoshop developer] can say, hey, if I had to do a Gaussian blur on this image, I can actually divide the image up into two halves and have one thread deal with the top half of the image, and have the second thread deal with the bottom half of the image and have them run in parallel.*





Here's hoping that Apple adopts the faster DDR RAM—soon.

## Optical Wars

One group giveth, another taketh away. While one consortium is trying to provide us with a standardized method of writing CD-RWs, another is trying to steal the hearts of Apple SuperDrive owners in favor of its standard.

**Mt. Rainier.** No, we're not talking about the mountain in Washington. This technology standardizes the way CD burners write information to discs so that any computer, running any operating system, attached to any CD drive, can read and write information as freely as it would with a floppy.

The Mt. Rainier standard would theoretically be built into the operating system and would allow you to drag and drop data to CD-RW discs—and it doesn't require packet-writing software such as Roxio's Toast. The file system burns data in small chunks, then verifies the operation before proceeding to the next chunk, repeating the process if an error occurs—and all of this occurs transparently to users.

Microsoft is reportedly adding support for Mt. Rainier in a later release of Windows XP. Apple has not voiced its opinion yet. Drive makers would also have to add support for Mt. Rainier to their CD burners—some, including Yamaha and Sony, are already committed. Unfortunately, legacy drives cannot read this format without new drivers. But if Mt. Rainier can alleviate the hassle of the error-riddled disc-burning process by even a smidgen, we say Amen.

**Battle over DVD.** Apple revolutionized the personal computing market when it released Macs with a built-in SuperDrive for burning DVDs. But the SuperDrive is actually just a Pioneer DVR-103, a DVD-R drive that people are lumping under a standard called DVD-R/RW (DVD dash R/RW, or more unkindly, DVD minus R/RW).

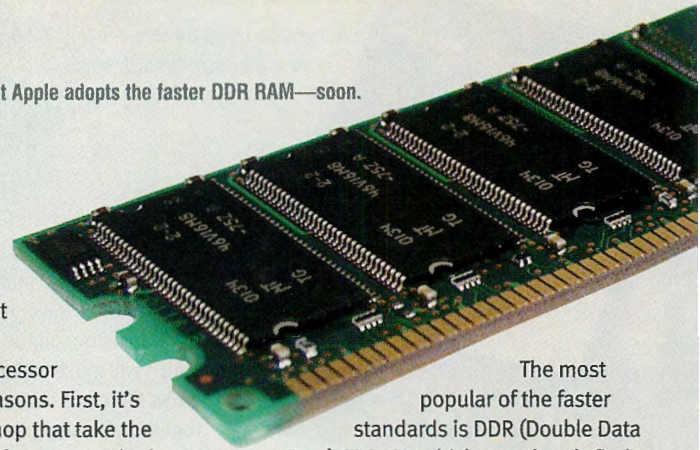
The opposition is DVD+RW (DVD plus RW). Here's the difference: Manufacturers of set-top DVD players must design in support for DVD-R/RW discs, while DVD+RW proponents tout their standard as generally not requiring any special support. They claim that almost all DVD players should be able to read DVD+RW-created discs (although some older players may have issues). Note, though, that more DVD-player manufacturers design in support for DVD-R than for DVD-RW, and the list of DVD players that will play SuperDrive-burned DVD-Rs is not small (check [www.apple.com/dvd/compatibility](http://www.apple.com/dvd/compatibility)).

>> If one G5 isn't good enough for you, how about two? We expect Apple to continue with its dual-processor philosophy, for several reasons. First, it's creative apps like Photoshop that take the most advantage of the performance a dual processor offers—and as we all know, Mac users are nothing if not creative. Plus, with Mac OS X's symmetric multiprocessing capabilities (see "Mac OS X: OS of the Future," p25), your Mac will take full advantage of a second processor (not the case in Mac OS 9). Also, there's an economic reason why the dual-processor strategy works for Apple but not for PC manufacturers. According to Glaskowsky, PowerPC chips are smaller than Pentium 4 chips, so they cost less to manufacture. To wit, the bulk price of Motorola's high end 1GHz MPC7455 PowerPC chip is \$295, while the bulk price of the high-end 2.2GHz Pentium 4 is \$562.

Finally, we can't discount the possibility that Apple will ditch Motorola altogether and ally with IBM, maker of the G3 chip in current iBooks. Just as Motorola is moving forward on PowerPC development, IBM is doing the same, including support for SIMD (Single Instruction, Multiple Data) capabilities, similar to AltiVec. IBM's continued support of PowerPC opens up another track to Apple should the Motorola train lose steam. Of course, the only person who can answer all of these questions is Steve Jobs—and he ain't talking.

## Memory Matters

A processor takes one of its biggest performance hits when it sends data to and from system memory. Current RAM—PC133 SDRAM—runs at 133MHz, as the name implies, and has peak data throughput of 1.06 GBps. The bad news is that memory is one area where Apple is lagging behind PC manufacturers. The good news is that several faster alternatives are waiting in the wings, and they'll make PC133 RAM feel like a 90-year-old grandma driving a Cadillac in the slow lane.



The most popular of the faster standards is DDR (Double Data Rate) SDRAM, which you already find

on graphics cards. DDR technology can perform two memory accesses per clock cycle, effectively doubling the performance of PC133. With the Pentium 4, Intel has decided to embrace the DDR standard, and it's using the Rambus RDRAM standard in its higher-end chips. Rambus is even faster than DDR, with memory speeds of up to 800MHz.

Don't expect Apple to welcome Rambus into its home anytime soon, however. The company is much more likely to embrace the more common and easily adaptable DDR. Although DDR modules do not fit into the same sockets as PC133 SDRAM, they look like and work similarly to existing SDRAM modules, easing the migration to DDR.

That migration may not happen until Apple's processors have the kind of system-bus speeds that can better take advantage of DDR's 200MHz or 266MHz performance. "When Apple has the G5, then they can use DDR, and I'm sure they will," says Glaskowsky. "I don't think they'd bother having a G5, at least at the high end of the product line, without DDR memory and maybe never with SDRAM. You can get Pentium 4s with SDRAM and it's a total waste of time and money to do it, so I think the same would be true of a G5 with SDRAM." That would be like having that same 90-year-old grandma in her Cadillac doing 40 in the *fast* lane. And we all know how painful that can be.

## Expanding Expansion

As bus speeds increase, another issue Apple will have to address is building faster expansion slots. Current Macs employ 64-bit, 33MHz PCI slots with throughput of up to 215 MBps, and a 4X AGP slot for the graphics card with throughput of up to 1,066 MBps. The AGP question is easy enough: AGP 8X is on the horizon, promising speeds of up to 2.1 GBps, and should start appearing in



# The Future of 3D Game Graphics

## Interview: nVidia

The reality of realistic-looking games is closer than ever for Mac users, thanks to powerful new graphics cards (see *PowerPlay*, p65). We talked to Jim Black, developer relations manager of nVidia, to find out just how bright the future looks.

*MA: What is the next big thing in game graphics?*

*JB:* Today, the next big thing is definitely pixel shaders and vertex shaders...The idea is [that if] I'm a game developer, I don't have to put something on a 2D texture and wrap it around [a model], and have that static light map or some low-quality vertex lighting be the only colors in my palette. With a programmable graphics chip, if I can conceive of a property that I want, I can program that specific effect. If I want to make a Jules Verne giant squid machine, with iridescent skin that reacts to specific caustic effects caused by rays of the sun going through a liquid, then I can do that.

*MA: What might games look like in a year?*

*JB:* You'll see much more dynamic environments, and you'll see a lot more detail that we take for granted in reality. It's kind of funny when you look back at games that were popular five years ago...We were willing to make a leap of faith and say, "Well that's fur. It doesn't really look like fur, but that's a wolf, so it must be furry."...People are going to not make that leap of faith [anymore], thanks to things like Xbox.

*MA: What do you mean by a dynamic environment?*

*JB:* The best example I can talk about is the lighting in the Doom engine that's under development. The shadows in that game are occurring in real time. If there's a light source and something comes between that, it creates these huge shadows over the wall. [Doom is slated to come out for Mac, but there is no set release date].

*MA: We're so used to seeing little circles represent shadows in games.*

*JB:* That's right! A blob! You're used to seeing a round blob. And if the light source changes, the round blob may skew, but what it doesn't do is crawl on the wall...Some of the demos I've seen, you'll walk into a room, and you see this huge shadow behind you, and you're like, "Oh my god, what is this?" Then a little dwarf marches in and says hi. But it can scare the heck out of you. It creates an entirely new experience.

*MA: Five years down the line, what will games be like?*

*JB:* Well, ten years down the line, you should not be able to tell the difference between a movie and something you're interacting with on your PC. That ultimately is the goal—to put people inside cinematic experiences and have them look as good as a movie.



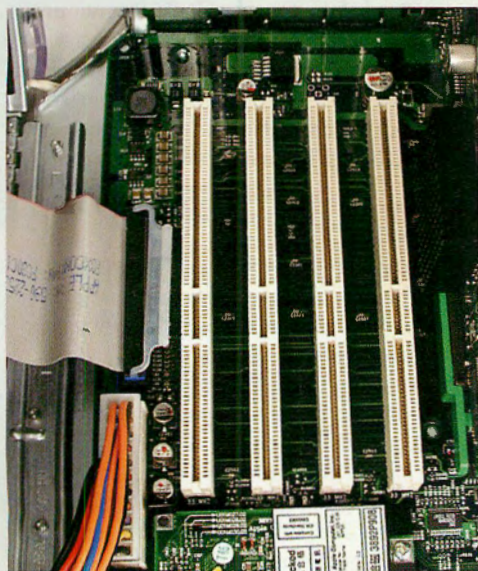
The latest high-end graphics cards for the Mac can make games look as cool as this Xbox one called Wreckless. We can't wait.

desktop computers sometime next year.

But what about PCI? The next giant leap is to PCI-X, a high-performance extension to the existing PCI bus. PCI-X is a 64-bit bus with speeds up to 133MHz (up from the maximum of 66MHz in plain old PCI) and throughput up to 1.06 GBps. Plus, PCI-X is backward compatible. For that reason, and also because Apple led the personal computing market when it went to 64-bit PCI, it's logical that Apple would eventually adopt this standard.

Of course, none other than Intel is working on yet another standard called 3GIO, which should provide faster performance than even PCI-X (and reports are that 3GIO will make it possible to use PCI cards in legacy PCI slots built into 3GIO-equipped machines). The main difference between 3GIO and PCI is that 3GIO is a serial technology, while PCI has a parallel-bus architecture. Serial can deliver high bandwidth in fewer signals, and serial connections don't have problems with the *delay skew* that occurs with parallel technology, in which bits arrive at different times and then have to synchronize.

So what kind of speeds is Intel talking about? Initially, 3GIO promises 2.5 Gbps in each direction per channel, but devices can connect via multiple independent channels for even higher throughput. Whether Apple will adopt 3GIO is another matter. "Apple is in no hurry to use [3GIO] since the PCI road map has another three or four or five years of further development," says Glaskowsky. "If 3GIO actually does establish itself as a high-end alternative for system expansion, then Apple will essentially be required to adopt it into its system." >>



Will Apple eventually move to PCI-X? Only time will tell.





USB 2.0 devices are starting to appear on the market.

# Hard Drives and the Future of FireWire

Smaller, bigger, cheaper, faster. That's the future of storage, says Mike Mihalik, who is currently responsible for product development at LaCie.

Right now, the largest magnetic hard drives have capacities of 180GB, but Mihalik says he wouldn't be surprised to see a 1-terabyte (that's 1,000GB) hard drive in the next two to three years. That's all thanks to breakthroughs that are allowing companies to double the areal density (or capacity per square inch) every 15 to 18 months. While capacities keep growing, prices are bottoming out—it actually costs about \$80 to make any 3.5-inch hard drive (the type you'll find in desktop computers), so companies can't go any lower than that.

Of course, that bottoming-out calls for new solutions.

Enter the 2.5-inch drive, the standard in notebook computers. Some hard drive manufacturers are talking about making these drives standard in desktop machines as well. They're smaller, so they're cheaper to manufacture and take up less room in a

machine. Plus, with all of the work on the areal density front, 2.5-inch drives are starting to get into the high-capacity range. According to Mihalik, manufacturers can now squeeze 20GB of storage onto a single 2.5-inch platter (the disc that rotates under the magnetic head as the drive reads or writes data). This would allow 60GB of storage if they stacked three platters.

Changes are also under way for how hard drives connect. The PC side is gradually moving from parallel ATA to serial ATA connectors, a move that would replace that gawky ribbon cable you find inside your Mac with a small, round, flexible cable that obstructs airflow less. Serial ATA is also faster than parallel. While current ATA drives top out at 133 MBps (Apple uses ATA/66), serial ATA will initially run at 150 MBps, with room to grow. However, the transition won't take place overnight. According to *Maximum PC*, motherboard integration of serial ATA on the PC side isn't expected until late this year or even next year.

So where does Apple stand on this issue? It's not talking—although, says Mihalik, "Apple will have to pay attention. Remember, it switched from SCSI drives to IDE drives to chase lower system costs."

While the discussion of serial ATA probably tickles the fancy of you hard-core Mac fans, the rest of you will probably have more interest in the connector battle that's brewing between USB and FireWire. USB 2.0 now offers speeds of up to 480 Mbps, and

the second coming of FireWire is around the corner (the chip sets have been ready for more than six months), initially promising speeds of 800 Mbps. Because Apple was a key player in the development of FireWire (also known as IEEE-1394 and, in Sony's world, iLink), we expect that the company from Cupertino will adopt 1394b on the motherboard. What it plans to do with USB 2.0, though, is another issue. Most manufacturers think Apple would be cuckoo not to adopt USB 2.0, since most devices—from external hard drives to CD-RW drives—are rapidly going in that direction in an effort to appeal to the PC market.

The majority of manufacturers also feel there's room enough for both standards. USB 2.0 will claim the low end (scanners, printers, mice, low-end hard drives, CD-RW drives), and FireWire will dominate the high end (DV cameras, networking devices, high-end hard drives, and CD-RW drives). Also, don't forget that FireWire provides 12 to 30 volts and 15 watts of power, while USB provides just 5 volts and 2.5 watts, so only FireWire can power huskier devices.

In the long term, 1394b should allow speeds of up to 3.2 Gbps using plastic optical-fiber or glass optical-fiber cabling instead of the copper wiring it currently uses. The optical-fiber cabling allows for faster speeds and longer transmission distances, up to 100 meters. What does all of this mean? 1394b will be freakin' fast and will offer possibilities beyond our wildest imaginings.



If you think FireWire flies now, wait till you see 1394b.

## Optical Intrusion: The Promise of Holographic Storage

Imagine being able to store 100 DVD movies, CNN's archives of live video footage, or the entire contents of the Library of Congress on something the size of an ice cube. That's the promise of holographic storage.

This optical-storage technology writes data in a method analogous to the way a camera records a photograph onto film. Using laser beams, holographic storage records your data as a 3D pattern of light and dark spots on a block of light-sensitive material. The kicker is that you can record a number of superimposed "images" onto holographic storage material, which you can't do with film. This is possible because during the writing process, the data-carrying laser crosses a second laser beam, called the *reference beam*.

Holographic technology can vary the reference beam's angle or wavelength to store a large number of images on the same volume of material. To read the data, the device reconstructs the light pattern of the two crossed laser beams used in the writing step.

If your neurons are having trouble processing that explanation, the important thing to note about holographic storage is that it can store huge amounts of information, it's more reliable than magnetic storage because it doesn't involve any moving parts, and it enables lightning-quick data-transfer rates (as high as a billion bits per second). One pitfall researchers have encountered is finding reliable recording material, but recently they've been making progress in that area.



# Displays Get Dazzling

When Apple released the new iMacs, Steve Jobs boldly declared the death of the CRT. But that may be wishful thinking on Steve's part.

According to Stan Glasgow, vice president of display-products marketing at Sony, the industry expects the number of flat-panel LCDs to draw level with the number of CRTs by the year 2007. And, he says, "that's predicated on a lot of things continuing very positively for LCD technology—continual improvement in yield rates, in technology, in how they do the transistor work, viewing angle, response time, and actual speed of the transistors." All while keeping costs down, of course.

While display companies are continuing to improve current CRT and LCD technologies, they are also working on development of the next big thing.

The heir apparent may be a technology called OLED (Organic Light-Emitting Diode). Unlike traditional LEDs and LCDs, OLED uses organic materials to generate light. A series of thin organic films between two conductors emits bright light when an electrical current is applied. The main difference between OLED and LCD panels is that OLEDs are emissive displays (they generate their own light), while LCDs are passive, meaning they either block or pass light from an external light source, such as a backlight, to produce what you see onscreen. >>



LCD technology should keep getting better over the next few years. But will a brighter new technology eventually usurp it?

## The Mac as Your Entertainment Hub Interview: Creative Strategies

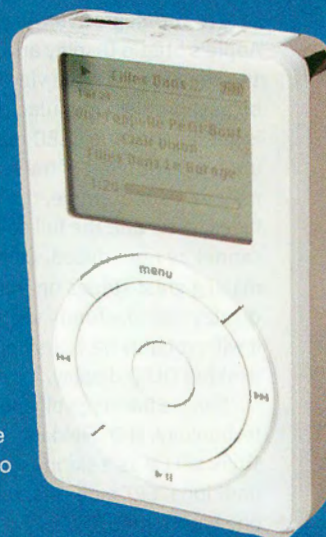
As president of high-tech consulting firm Creative Strategies, Tim Bajarin is one person who thinks Apple should take its innovations outside the office computer. We talked to Bajarin about what he thinks is Apple's next big hurdle.

MA: What do you see as the next big technology trend?

TB: From Apple's standpoint, at least from the way they've approached it so far, they've fundamentally emphasized the PC in its creative role and have not really crossed over to entertainment in the living room. What we think will happen is that while the digital-hub model works for the creative center, there's probably going to be [an emergence of] this digital hub as an entertainment center as well. [Apple has] not declared a strategy for this digital-entertainment hub as of now.

MA: How would the digital-entertainment hub work?

TB: Well, the idea is that I could create a digital storybook on the creative center in my house, but because of wireless technology and the user interface and the integration of the way these devices talk to each other, I could display it and interact with it in the living room. And in a perfect world, I may create it in my house in San Jose and send it to my mother in, let's say, New York—and I'm sending it to her television and not necessarily her computer.



The iPod is part of the digital hub. Will Apple move to the entertainment hub next?

MA: What are some of the technologies that will make this entertainment hub happen?

TB: Well, there's a slew of things. 802.11, specifically either g or a, along with b, can be important; [the] next-generation storage medium...we're not talking gigabytes, we're talking about terabytes...Other technologies would be software that allows programs to work together and interact between the digital-entertainment hub and the digital-creative hub—operating systems, user interface, potentially voice, even handwriting recognition.

MA: How do you see Apple's role in this?

TB: It's unclear to me whether [Apple will] decide to also throw their hat into the ring in the context of creating a Mac-based entertainment hub. But it's conceivable, right? One of the things Microsoft is doing that makes you watch what they're doing so carefully is that they basically are trying to marry Windows XP, and specifically 32-bit code under Windows XP, and carry that over to other devices—handheld devices, set-top box, Web TV, whatever...The question is, does [this entertainment hub] get delivered by the PC guys, or can the consumer-electronics guys come in? That's one of the big technology wars that will emerge in the next three years.

MA: Is this something Apple needs to do to continue to be successful?

TB: While it's an incredibly risky proposition, I have to believe this is something they're going to do in order to extend the Mac beyond its current user base.





>> People in the display industry are going gaga over OLED technology for a number of reasons. Since OLED doesn't require backlighting, the resulting displays are thinner, lighter, and less power-hungry than traditional LCDs. Also, OLEDs have wider viewing angles—over 160 degrees—as opposed to LCDs, which typically have a 120- to 160-degree viewing angle (LCDs like Apple's Studio Display and Formac's gallery 1740 have 160-degree viewing angles). The biggest problem manufacturers have faced is getting the blue OLED material's quality up to par with that of the red and green material—for example, the blue material fades faster and the full color spectrum cannot be reproduced. Companies are making great strides on that front, although display manufacturers seem to agree that it will probably be years before we see a desktop OLED display.

Sony is backing still another display technology: FED (Field Emission Display). Think of FED as a skinny version of CRT. In traditional CRT monitors, three large guns—one each for red, blue, and green—spray electrons toward phosphors that light up pixels onscreen; in an FED monitor, millions of submicrometer tips emit the electrons that light up the phosphors. Because FED doesn't require a huge tube, the display can be as thin as 2 or 3 inches. In essence, FED takes the good parts of CRT technology (bright color and responsiveness) and junks the bad part (bulk). The problem facing FED technology is figuring out a way to manufacture it en masse economically.

## Wireless Explodes

First there was 802.11b. Now there's 802.11a. Next will come 802.11g. 802.11g will be compatible with 802.11b, but neither 802.11b nor 802.11g will be compatible with 802.11a. That's because 802.11a uses a different frequency on the radio spectrum than 802.11b and g.

Anyone else have a headache?

Let's clear the air here: 802.11b, better known to Mac lovers as AirPort, offers data rates of up to 11 Mbps and uses the 2.4GHz-frequency spectrum (see "What's the Frequency?" below). Those specs create several problems, though. While 11 Mbps is

fine for browsing the Web or checking email, it's not fast enough for, say, transferring large graphics files or streaming DVD-quality video. Also, the 2.4GHz-frequency range is starting to get as crowded as a British soccer—er, football match. Many cordless phones, baby monitors, Bluetooth devices, and microwave ovens operate in the 2.4GHz space, which potentially causes interference for your network. Microwave popcorn while surfing the Web, and you may end up with a network slowdown. Who knew?

802.11a is trying to be the wireless industry's knight in shining armor. This new wireless standard offers speeds of up to 54 Mbps and operates in the 5GHz-frequency range, a far less crowded space. Unfortunately, 802.11a is not compatible with 802.11b—your AirPort card will not work with an 802.11a network, and an 802.11a card will not work on an 802.11b network.

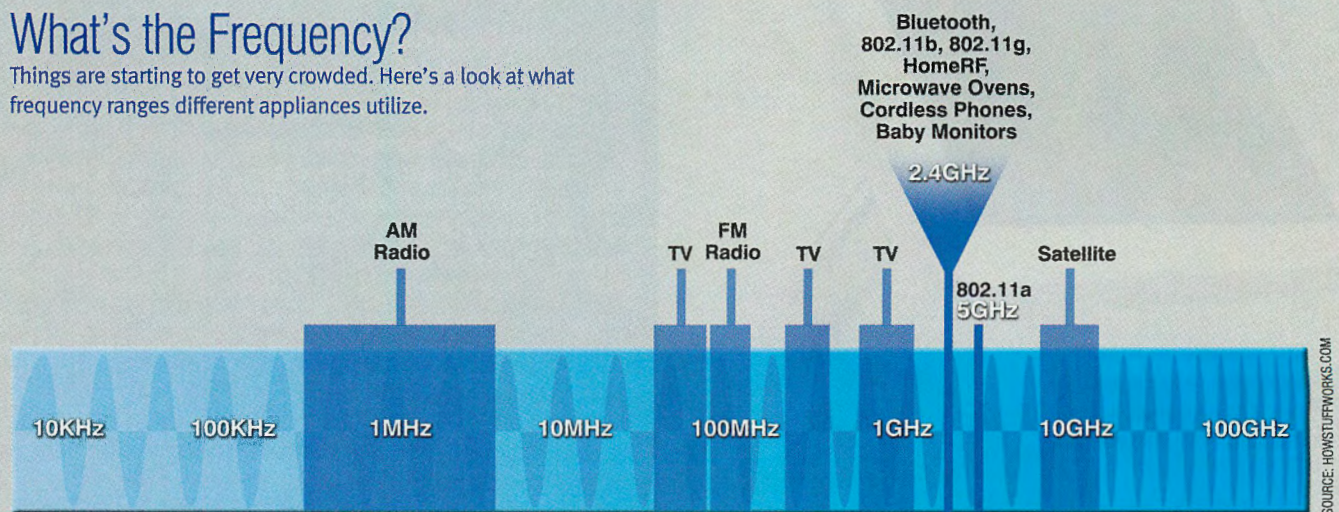
That doesn't mean Mac users will be left in the cold. Networking company Proxim has already released several 802.11a products for Windows, including access points, gateways, and CardBus cards. The company plans to deliver Mac drivers for those products this year, including OS 9 drivers in spring and OS X drivers in summer. And while 802.11a does require a different antenna from the one built into your Mac, that shouldn't be an issue, because the 802.11a-compatible antenna is already attached to the CardBus card.



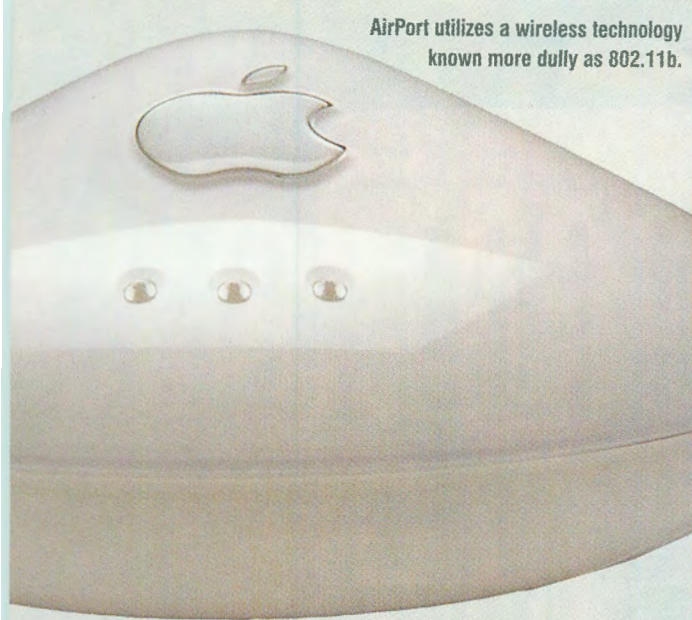
Need faster wireless access? Proxim will be releasing Mac drivers for its 802.11a products this year.

## What's the Frequency?

Things are starting to get very crowded. Here's a look at what frequency ranges different appliances utilize.







End of story, right? Not exactly. 802.11g is yet another standard the IEEE will probably ratify early next year. It will offer data rates of up to 54 Mbps and will operate in the 2.4GHz range. It will also be backward compatible with 802.11b, so you can use your 802.11b cards with 802.11g access points (but only at the slower speeds).

For the time being, Apple is standing behind the 802.11b standard, although eventually you could have the best of both worlds. Ken Haase, director of product marketing for Proxim, says that in the future you will probably see dual-mode adapters compatible with both 802.11a and 802.11b or even 802.11g. These adapters are analogous to the dual-band cell phones that utilize, say, both analog and GSM networks. There are also dual-band antennas that work in both frequency ranges. "If I'm building a future Mac and preparing for possible higher bandwidth," says Haase, "I would put in a dual-band antenna."

There are also several other interesting wireless solutions, each with unique qualities. First there's HomeRF, which offers speeds of up to 10 Mbps and operates in the 2.4GHz range. HomeRF promises streaming media as well as voice and telephony capabilities. Since it provides standardized quality-of-service support for streaming media (meaning it prioritizes transmitted material), it's possible that you could, say, stream MP3s from your Mac to a stereo. Its unique voice features will also allow one device to act as a wireless and phone base station, so you can potentially dial a phone number from within your email program, or even receive email messages on your phone.

Last but not least, there's Bluetooth, which offers data rates of up to 1 Mbps and has the potential to provide wireless communications among cell phones, PDAs, keyboards, and printers, and literally eliminate all of those unruly cords hooking up your peripherals and your Mac. Palm recently blessed Bluetooth (see *Get Info*, p17) with its Secure Digital Bluetooth card, which allows you to do things like use your Palm to place a cell-phone call.

People have been talking up Bluetooth for almost two years now, yet we've seen few results—at least until now. This just goes to show that it's impossible to predict which technologies will fly and which ones won't. Either way, it looks like an exciting cordless future. ■

Cathy Lu has been an editor at *MacAddict* for more than two years. After writing this article, the only thing she wants in her future is a good night's sleep.

## The Future of PDAs

### Interview: Palm

**How small, how fast, and how slick will handheld computers become? We talked to Palm's own David Christopher, senior director of handhelds, to find out.**

*MA: What are some of the technological trends you're seeing in the handheld space?*

*DC:* There's a move to update the processors to use our more multithreaded operating system and [a move toward] very capable processors that can multitask. Battery technologies are getting better—much thinner, much lighter—to enable smaller products. Screen technologies are getting very, very good...[And] I think you'll see flexible LCDs—that's a little more futuristic—but the idea is you could have a...walletlike device that you could fold and put in your pocket.

*MA: What about high-speed wireless on a handheld?*

*DC:* Bluetooth, 802.11, CDMA, GPRS—all enable high-speed access via handhelds.

*MA: How fast will your connection be?*

*DC:* Devices that incorporate a wide-area radio like next-generation CDMA or next-generation GSM radio will be very high-speed...analogous to DSL on the desktop today.

*MA: Obviously, given Palm's new Bluetooth card, you think there's a lot of viability in Bluetooth. Do you think Apple needs to consider implementing Bluetooth?*

*DC:* Apple will definitely have to consider implementing it in laptops and other mobile devices, and potentially in their desktop series.

*MA: What's happening on the software side?*

*DC:* Software that allows a device to, for example, talk to a GSM radio in a wide-area scenario and then come into a corporate campus and seamlessly switch and say, "OK, I'm no longer connecting to a cellular tower, now I'm connecting to an access point within a building." Software that enables that to happen seamlessly is a big, big effort. On the user [side], there's lots of software that will come to bear in a couple of years, such as speech to text...as well as voice commands—the ability to say "Cathy" and have your number just be dialed.

*MA: Can we have one device that does everything—a handheld, cell phone, MP3 player?*

*DC:* TV [laughs].

*MA: And all on your watch, right? But is that possible?*

*DC:* It is possible, but instead of being a watch, it will be a backpack. The reality is that all of those things take battery life, take processing power, take size on the actual board, so you can do many of those things today, but they're exactly what you see in the marketplace—kind of big, kind of clunky, not really ideal...The convergence of all that functionality might come eventually, but it's going to take some very clever thinking on how to package it attractively, how to get the weight down, how to get the battery life up, and how to get the software such that it's a great user experience.



**This Bluetooth card from Palm allows you to communicate wirelessly with certain cell phones or another PDA.**





# *MacAddict's* **Encyclopedia**

by Rik Myslewski  
("Secure Shell" by Ian Sammis)  
photography by Marc Madeo



Installing and using a network is easy—as long as you speak the lingo.

In this comprehensive encyclopedia of networking knowledge, we demystify all the info you need to get your SOHO (small office/home office) network up and humming.

You know why you want to network the Macs in your home or small office. You want to share files, print to your network-capable printers, share a broadband connection to the Internet—even send instant messages to others when you're too lazy to walk down the hall.

One problem: When your network-savvy friends start giving you advice about hubs, switches, routers, CAT-5 cabling, and firewalls—or when they start spouting terms like PPP, TCP/IP, NAT, and DHCP—you begin to think living in a nonnetworked world isn't all that bad.

Or maybe you've already set up a SOHO network—and it's running just fine, thank you—but you have a nagging feeling that you don't *really* know if your hub or switch is full duplex, or understand why your Power Mac's Gigabit Ethernet performance has been disappointing, or have the tools to diagnose and fix network problems remotely. Don't be shy—we could all benefit from a little continuing education.

Whether you're a networking newbie or an IT wanna-be with a thirst for Net knowledge, we're here to help. “MacAddict's Encyclopedia of Networking” explains the jargon you need to know for network success, and provides tools and tips for getting the most out of your wired or wireless network.

# of Networking

**10Base-T** A version of **Ethernet** that transmits data at a maximum rate of 10 **megabits** per second. 10Base-T uses **twisted-pair** cabling similar to the cables used in telephone lines.

**100Base-T** The most common version of **Ethernet** in use today, 100Base-T—also known less commonly as Fast Ethernet—transmits data at a maximum rate of 100 **megabits** per second over the same **twisted-pair** cabling used by 10Base-T.

**802.11b** This specification for wireless networking is the basis of Apple's **AirPort** technology, and supports a data rate of up to 11 **megabits** per second.

**Active hub** In addition to forwarding data from one **Ethernet** device to another, an active hub also amplifies the signal carrying the data.

**Adaptive bridge** Essentially a **bridge** with memory, an adaptive bridge remembers the addresses to which it has sent data so that subsequent transmissions to the same address can be accomplished more quickly and efficiently.

**AirPort** Apple's AirPort wireless technology is based on the **802.11b** specification, which allows both peer-to-peer talk and communication between a client and a base station—whether an Apple AirPort Base Station or a third-party alternative, often called an **access point**. You can equip any currently shipping Macs with an AirPort client card.

**AppleTalk** This venerable standard is Apple's original **protocol** for network communication. AppleTalk breaks up data into a large number of small **packets**. This is a useful scheme for slow, inefficient networks, since resending damaged packets takes less time than it would for larger packets, but it's a drag on high-speed, efficient networks. AppleTalk networks—especially larger ones—are also prone to a large amount of **bandwidth**-robbing chatter, because each and every time a device is plugged into the network, every other device will broadcast its name and address to the new device. **DHCP**-based networks, on the other hand, use a single machine to manage network identities—a much more efficient scheme.

**Bandwidth** The amount of data that can travel through a network—or any information pipeline, for that matter—in a given period of time. As is true of storage space, cash, and free time, you can never have too much of it.

**Bridge** A device that connects two network segments. A bridge simply passes along **packets**, and doesn't analyze their addresses as a **router** does or translate between different **protocols** as a **gateway** does. However, sloppy IT wanna-bes sometimes use the three terms interchangeably.

**Broadband** A relative term, broadband refers to current high-speed, high-**bandwidth** data-transfer technologies. Today's broadband darlings include **DSL** and **cable modem**—tomorrow, who knows?

**Broadband router** Also known as a cable or **DSL** router (and less commonly as an Internet router), a broadband router connects your network with an **ISP**'s broadband service. Most broadband routers include a multiport **hub** or **switch**, in addition to acting as both a **DHCP** server and a **NAT** firewall.

**Cable modem** A **broadband** technology that provides Internet access over your cable TV (CATV) line. Data-transfer speeds range from 3 to 50 **megabits** per second. Because you share a cable modem with other subscribers, how much your neighbors use the Internet affects your connection speed.

**CAT-5** The most common type of **twisted-pair** cable in use today, rated for 100MHz sustained signals. Both **10Base-T** and **100Base-T** networks use CAT-5.

**CAT-5e** Enhanced CAT-5 cable. Wire heads will argue whether CAT-5e cable is even significantly better than CAT-5—let alone capable of effectively handling **Gigabit Ethernet**.

**CAT-6** An emerging standard, CAT-6 cable is rated for 200MHz to 250MHz signals, and should provide **Gigabit Ethernet** with more **bandwidth**.

**Crossover cable** An **Ethernet** cable with the wiring of its **RJ-45** connectors reversed so that it can directly connect two Ethernet devices without requiring a **hub** or **switch**.





# Wired <...>

Sure, wireless networking is cool and convenient, but good ol' cable has lots of advantages.

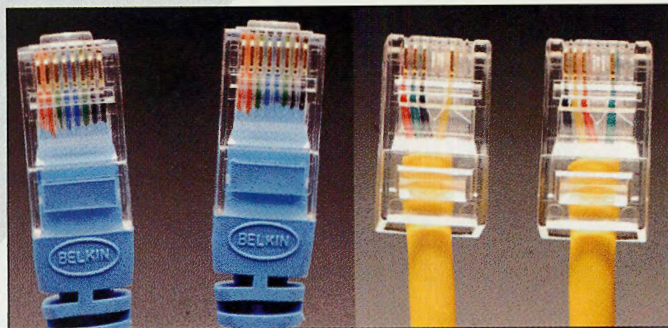
When setting up a SOHO network, the first thing to decide is whether your network should be wired or wireless. A wireless network has obvious advantages—no cables to futz with and complete freedom of movement—but don't dismiss the cable option too quickly.

The most compelling reason to install a wired network is speed. The current generation of wireless technology—known by the prosaic moniker of 802.11b or here in the Apple sphere as AirPort—offers a meager 11 Mbps (megabit per second) bandwidth. That's only a hair faster than the oldest wired network still in common use, 10-Mbps 10Base-T Ethernet, and way slower than the current standard, 100-Mbps 100Base-T Ethernet. Sure, faster wireless technologies are on the horizon (see "The Future of the Mac," p22), but none comes close to the speeds of 100Base-T—let alone Gigabit Ethernet.

So if your network needs fast file transfers, it's time to start stringing cable. If you only want to connect two Macs, or one Mac to a printer—and yes, these straightforward setups are technically networks—all you need is a crossover cable. Plug one end of the crossover cable into your Mac and the other end into another Mac or printer. You've just created a network.

If you need to connect more devices, invest in an Ethernet hub or switch. Don't worry, it's a tiny investment: You can find a four-port 10Base-T passive hub for less than \$30 from Mac-friendly vendors such as Proxim ([www.proxim.com](http://www.proxim.com)), but we recommend moving up to a five-port 10/100Base-T hub such as the \$47 FriendlyNet 10/100 Fast Ethernet desktop hub from Asanté ([www.asante.com](http://www.asante.com)). Of course, if you have more devices, you'll need more ports, but that won't cost much more: An eight-port hub runs around \$65 to \$75.

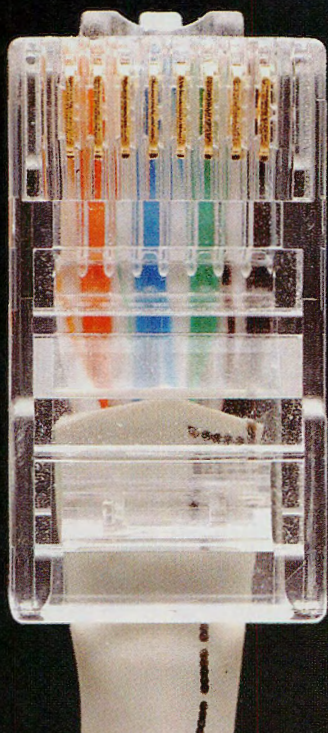
For a few dollars more, you can switch to a switch—if you're running a busy network, you'll appreciate the performance improvement. Asanté's five-port FS5005 10/100Base-T switch, for example, costs a mere \$61, and you might find even better deals from vendors like SMC Networks ([www.smc.com](http://www.smc.com)) or Netgear ([www.netgear.com](http://www.netgear.com)).



A standard Ethernet cable (left) has colored wires running to the same contacts at both ends. A crossover cable (right) switches 'em. Don't get them confused.

Of course, running Ethernet cables around your house can get messy fast. If you want to do it right (and if you're planning a home remodeling or don't mind tearing open a couple of walls), string CAT-5, CAT-5e, or CAT-6 cable from each room in which you want network access to a centralized location, such as a well-ventilated closet or a part of your basement not already stuffed with your prized collection of Blatz, Schlitz, and Grolsch beer signs. And make sure you do it right: Don't force cable into tight, right-angle curves; keep it away from AC lines; and please, *please*, don't wrap it around nails.

To the cable in each room, attach wall-mounted keystone jacks as portals to your SOHO network. In your basement or closet lair, connect each cable to a wall-mounted patch panel rated the same as your cable—CAT-5, CAT-6, whatever. Into these you plug Ethernet patch cords, which you then connect to a centralized hub or switch. Both Belkin ([www.belkin.com](http://www.belkin.com)) and Homaco ([www.homaco.com](http://www.homaco.com)) are great sources for fair-priced, high-quality patch panels. Oh, and do you want to share broadband Internet access across your network? Read "Hitch a Ride on Any Broadband Line," (Dec/01, p70; a PDF is on this month's Disc).



**DHCP (Dynamic Host Configuration Protocol)** Software running on a server, router, or switch that provides a dynamically generated **IP address** to each computer on a network. Combined with **NAT**, DHCP gives computers that don't have a **static IP address** the ability to connect to the Internet.

**Downstream** The direction of data flowing from the Internet—or any server—to your Mac.

**DSL (digital subscriber line)** A **broadband** technology that provides Net access over phone lines. Broadly speaking, DSL is divided into two subgroups: ADSL (asynchronous DSL), in which the **upstream** and **downstream** rates differ; and SDSL (symmetrical DSL)—we're sure you can figure that one out. Theoretically, DSL maxes out at 9 **megabits** per second **downstream** and 640 kilobits per second **upstream**, but 1.5 Mbps and 128 Kbps are far more common speeds.

**Ethernet** Invented in 1976 by Bob Metcalf, the founder of 3Com, Ethernet is by far the most common **LAN** architecture today. Typical Ethernet implementations, **10Base-T**, **100Base-T**, and **Gigabit Ethernet**, use a "star" connection scheme in which each computer connects to the others through a **hub** or **switch**.

**Firewall** A firewall can be any number of different schemes that protect computers on one **LAN** against the unwanted intrusion of hackers attempting to access it via the Internet. An **AirPort Base Station**, for example, uses **NAT** as a simple but effective firewall.

**Full duplex** In a full-duplex connection, devices can send and receive data at the same time (unlike **half duplex**), essentially doubling their potential **bandwidth**.

**Gateway** A struggling PC manufacturer, or a device that connects two networks running different **protocols**, translating data from one protocol to the other.

**Gigabit Ethernet** An emerging version of **Ethernet**, Gigabit Ethernet theoretically has the ability to transmit data at a maximum rate of 1,000 **megabits** per second over **twisted-pair** cabling similar to that used by **10Base-T** and **100Base-T**, but higher quality. To take full advantage of Gigabit Ethernet, you need good-quality cabling, a powerful Power Mac, and an OS that supports **jumbo frames**—**packets** that carry six times as much data as standard Ethernet frames. Mac OS X does; earlier Mac OSs don't.

**Half duplex** In a half-duplex connection, devices can either send or receive data—but not both—at any given moment.

**Hub** A central device to which a number of computers or **LANs** connect and through which they communicate, sharing the same **bandwidth**. Hubs always function in **half-duplex** mode. A **switch** or **router** can perform the same central-connection role as a hub.



# Wireless <...>

Can't afford to rip up your home or office to install cables? Go wireless—but do so carefully.

If high-speed networking is not an absolute necessity for your SOHO needs—and let's be honest, it probably isn't—wireless AirPort technology may be the way to go. No cables cluttering your floor, no tearing into walls, no pain-in-the-ass installation of multiple keystone wall jacks—just simple, easy, no-brainer wireless access to file sharing, printers, and the richness of the Internet.

Yeah, right. If only it were that easy.

Don't get us wrong. Apple's AirPort Base Station—especially the new, greatly improved Snow model (see *Reviews*, Mar/02, p55)—is a great SOHO-network problem solver. However, this wireless technology brings a few problems of its own.

First of all, let's face facts: Cables are simple, physical, brutish things with but one purpose in life, to carry data from one place to another. The radio spectrum, on the other hand—the rarified ether in which AirPort's 802.11b technology operates—is a much less sturdy environment, prone to interference from a number of sources. You may need to try different locations for your AirPort Base Station to get the best performance—and remember, performance will worsen the further your Macs are from the Base Station.

If you have a 2.4GHz cordless phone, watch out—it's operating on the same frequency as the AirPort. If you find that you occasionally lose the connection with your AirPort Base Station, ask if anyone in your home or office just picked up the phone—there's a good chance the signals are conflicting. If so, try moving the phone far from the Base Station, or try selecting a different AirPort channel. If that doesn't work, switch to a 900MHz phone—at short distances, they work just as well and are significantly less expensive.

When you're planning your AirPort network, don't forget about printing. You can, of course, print the old-fashioned way, directly from your Mac (USB or Ethernet) or AirPort Base Station (Ethernet). Or you can go fully wireless by hooking your printer's parallel port to a wireless print server. A number of these are available from

manufacturers including Buffalo Technology (AirStation Wireless Print Server LPV-WL11, \$199; [www.buffalotech.com](http://www.buffalotech.com)), D-Link Systems (D-LinkAir DP-313, \$199; [www.dlink.com](http://www.dlink.com)), and Linksys (EtherFast Wireless PrintServer WPS11, \$129; [www.linksys.com](http://www.linksys.com)). Unfortunately,



With support for 50 Macs, 128-bit encryption, and two Ethernet ports, the Snow incarnation of Apple's AirPort Base Station is a big improvement over the earlier Graphite model.

we've only been able to track down one that explicitly offers Mac support: Hewlett-Packard's wp110. We say *unfortunately* not because the wp110 is a lousy product—it works well and supports a lot of HP printers—but because it costs a hefty \$299 ([www.hp.com](http://www.hp.com)). For that princely sum, you could buy a half-dozen Epson Stylus C40UX inkjet USB printers and hook up one to each Mac on your SOHO network.

Also, remember that Apple's AirPort Base Station is not your only wireless option—though it's a good one. The companies mentioned above, as well as Mac-friendly stalwarts like Asanté and Proxim, also offer affordable access points—that's PC talk for base stations. If your PowerBook doesn't have an AirPort card slot, Asanté and Proxim offer Mac-compatible 802.11b PCMCIA cards. For pre-AirPort G3 and G4 Power Macs, Proxim will sell you a PCI card with one of its Skyline 802.11b PCMCIA cards attached for \$159 (check the company's Web site for compatibility info first, though—this setup doesn't work with certain older Power Mac G3s). Finally, Asanté is readying Mac support for its AeroLan wireless USB adapter—it should be ready Real Soon Now.

**IP address** A series of four numbers separated by periods that identifies each individual computer to a network running the TCP/IP protocol (including the Internet). Each number must be between 0 and 255—Apple's Web server, for example, has an IP address of 17.254.0.1. An IP address can be permanent (**static**) or dynamically assigned by an **ISP**, **DHCP** server, or other software agent.

**ISP (Internet service provider)** An Internet-access provider that gives your Mac either a **static IP address** or a dynamic one that usually changes each time you log on.

**Keystone jacks** If you have the good fortune—and the small fortune required—to install **twisted-pair Ethernet** cabling in your walls, use keystone jacks for your **RJ-45** wall sockets. Whether you get the type that don't require any tools for installation or the simpler (and cheaper) ones that require a wire punch, keystone jacks are sturdy and easy to install.

**Kilobit** 1,000 bits; also, 1,024 bits (both often written Kb). Marketers created the first definition; engineers created the second, which is equivalent to  $2^{10}$ .

**LAN (local-area network)** There's no hard and fast definition of what constitutes a LAN—though some IT types will try to convince you that there is. But it's generally agreed that a LAN comprises a small grouping of computers, printers, **hubs**, and other such devices—your SOHO network, for example, or the devices on one floor of an office building.

**Mac OS X protocols and services** Mac OS 10.1 supports a veritable alphabet soup of **protocols**, file systems, and other services. It's unlikely you'll ever need to worry about most of them on your SOHO network, but should someone ask, here are some of the most important: AFP, BOOTP, CDSA, CHAP, **DHCP**, DNS, EIEIO, FAT, FTP, HTTP, ISO 9660, LDAP, NFS, NTP, PAP, PPP,

PPPoE, RIP, SLP, SMB/CIFS, TCP/IP, UDF, UDP/IP, UFS, and WebDAV. (Just kidding about EIEIO, by the way. Geek humor.)

**Megabit** As with kilobit, marketers have shifted the true definition of megabit from  $2^{20}$  (1,048,576) bits to a more easily understood 1 million bits. Both are often written Mb.

**Multihoming** An operating system that can communicate through more than one network interface at once—**Ethernet** and **AirPort**, for example, have multihoming capability. Mac OS X's multihoming Automatic Networking feature chooses the best available network-connection option, whether you're plugged into an Ethernet port, accessing an AirPort Base Station, or plugged into a dial-up line.

**NAT (network address translation)** This scheme enables any number of computers on one **LAN** to communicate with the Internet using only one **IP**

**address**. Although a NAT scheme can operate in a variety of different ways, the basics are always the same: The IP addresses within the **LAN**—usually assigned dynamically by a **DHCP** server—are all mapped to a single, fixed IP address that a NAT-enabled **router** or other such device uses to connect to the Internet at large.

**Packets** Data traveling across a network—including the Internet—is divided into discrete bundles called packets. In addition to the data itself (sometimes called a **frame**), each packet has a header that tells other network-connected devices what **protocol** it's using and where it's headed. Packets also transmit other information, including error-detecting schemes.

**Passive hub** Essentially as dumb as a stump, a passive hub simply connects devices, allowing them to pass data among themselves.





# File Sharing <...>

Having trouble setting up file sharing in Mac OS X? You're not alone.

Very few SOHO networks are large enough to need a file server, so the Mac OS's peer-to-peer file-sharing capability is the best way to swap files from Mac to Mac. Unfortunately, this feature—which worked seamlessly in Mac OS 9 and before—hasn't made a graceful transition to Mac OS X.

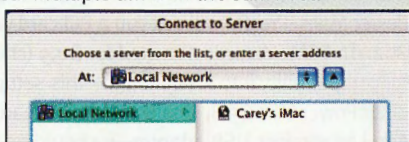
Enabling file sharing remains easy. In Mac OS X, open Sharing in System Preferences, go to the File & Web tab, then click the File Sharing Start button. In Mac OS 9, turn on file sharing in—where else?—the File Sharing control panel, making sure to check the box labeled Enable File Sharing Clients To Connect Over TCP/IP.

In theory, it's equally easy to access a Mac on which you've enabled file sharing. In OS X, simply pull down the Go menu in the Finder, select Connect To Server (or press Command-K), then click Local Network in the left column of the dialog that appears. In OS 9, open the Chooser and click the AppleTalk icon. In both cases, a list of available Macs should appear in the right column.

If you're running OS X, and if a logical and complete list of file-sharing-enabled Macs just showed up in your Connect To Server dialog, congratulations. We—and a number of other Mac OS X users—haven't been as lucky. (By the way, our SOHO setup consists of six G3 and G4 Macs running a mix of OS 9 and OS X; a Linksys cable and DSL router, firewall, and DHCP server with a 4-port switch; an Asanté 10/100 Ethernet switch connected via its uplink port to the EtherFast; and a Netgear 10/100 hub to handle the network's laser printer.)

Mac OS X's Connect To Server dialog doesn't like our network. Sometimes Macs—both OS X and OS 9—refuse to show up on the list. Sometimes OS X Macs appear multiple times in the same list.

How many file-sharing-enabled Macs do we have on our network? Six. How many feel like showing up today? One.



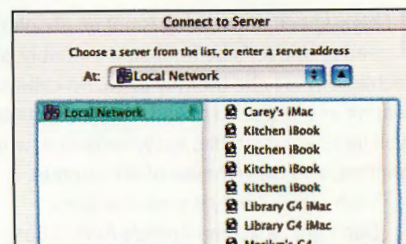
Sometimes the listed names of OS X Macs don't match their IP addresses. If you've experienced the same errors, you know how it feels: frustrating.

We've yet to find a solution, but we've found some workarounds. The easiest is to skip the TCP/IP-based Local

Network entirely, and rely instead on the slower but less finicky AppleTalk—its peer-to-peer verification won't bog down a small network, though it can wreak havoc on larger ones. To switch to AppleTalk, open Network in the System Preferences app, go to the AppleTalk tab, then check the Make AppleTalk Active box. Now open the Connect To Server dialog and select the AppleTalk icon; you'll see a well-behaved list of all your networked Macs in the right column. The problem? Sometimes this workaround doesn't work.

Workaround number two: If a Mac doesn't appear in the Connect To Server dialog, close the dialog, walk over to the recalcitrant Mac, and turn off, then turn on its file sharing. Walk back to your Mac and open the Connect To Server dialog, and that Mac might reappear. Maybe.

Workaround number three: Write down the IP address of each Mac on your network and keep the list handy. Now, whenever you open the Connect To Server dialog, ignore the list of Macs entirely, type the appropriate IP address into the Address field, then click Connect. Yes, it's inelegant; no, it's not Mac-like; and, yes, if you have a DHCP server on your network, your Macs' IP addresses may change when you reboot the server—ours did for our OS X Macs, but not for our OS 9 Macs—but you *will* connect. Probably. Isn't networking fun?



Some of the Macs on our network are suffering from multiple-personality disorder.



**Patch panel** A panel of RJ-45 ports to which twisted-pair cables are attached (at the other end of which are wall sockets with keystone jacks). Ethernet cables—patch cords—then run from the patch panel's ports to the appropriate ports on a hub, switch, 802.11b base station, cable or DSL router, or any other connectivity device as appropriate.

**Plenum-rated cables** A plenum is any air-filled space in a structure—like the space above your ceiling or in your walls—where you could route twisted-pair cable. If you're stringing cable for a wired Ethernet network, choose plenum-rated cables (marked CMP, MPP, or both) insulated with FEP (fluorinated ethylene polymer), and not the generally less expensive composite-core cables. The thinner and more flexible FEP-insulated cables are not only easier to work with, but also burn about one-fourth as fast as the cheap stuff and give off far less toxic smoke.

## POTS (plain old telephone service)

The standard copper phone lines that serve modems and DSL. No, we're not kidding—phone pholks actually use that acronym.

## PPP (Point-to-Point Protocol)

This protocol is currently the most popular way to connect to the Internet over a dial-up connection. It has certain advantages over its predecessor, SLIP, including faster speeds and better error handling. Unfortunately, America Online doesn't use PPP—one of the reasons Apple's original AirPort wireless networking device couldn't dial out to AOL.

## PPPoE (Point-to-Point Protocol over Ethernet)

Certain ISPs, instead of supporting Internet access over a LAN by way of TCP/IP, use the somewhat kludgy solution of PPPoE. Try to avoid PPPoE if you can.

**Protocol** More properly known as a *communications protocol*, a protocol lays down the ground rules so that computers can exchange data, and does so in a way that allows the computers and their supporting networking hardware (such as routers and bridges) to check for and recover from transmission-induced errors. The Mac OS supports the AppleTalk and TCP/IP LAN protocols.

**RJ-45** This name designates both the port and the jack of a standard network connector. The jack, which looks like a buffed-up RJ-11 telephone jack (see "Wired," p34), can handle eight wires compared to RJ-11's four. A network connection requires only four of RJ-45's eight wires. Oh, and forget about the urban myth that the letters "RJ" stand for the inventor's initials—they're short for "registered jack."



# Secure Shell <...>

Need to access your SOHO network while you're on the road? You can—but make sure you're secure.

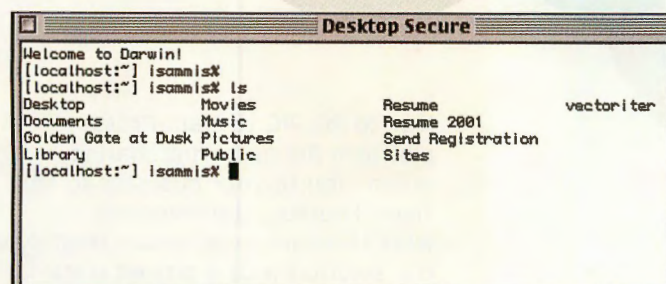
So you've got your SOHO network running, you're renting a static IP address from your ISP, and you're having grandiose visions of controlling your Mac from anywhere in the world. Those dreams could come true—but if you're not careful, they'll turn into a nightmare. One slip-up, and you'll inadvertently hand the keys to your machine to anyone who comes a-snoopin'.

Why? Well, traditional methods of connecting to a remote machine—FTP, for example, or Telnet—transfer everything you type (passwords, commands, file names, and so on) as plain text. That was safe enough on a Mac OS 9 system running NetPresenz (<http://interarchy.com/netpresenz>) or some other OS 9–based FTP server—the worst that could happen was that hackers would access shared files. On Unix-based OS X, however, lack of caution could lead to disaster: If you check the Allow Remote Login box in the Applications tab of the Sharing preference panel, then expose your password, a hacker could use your system to do anything he or she felt like. Anything.

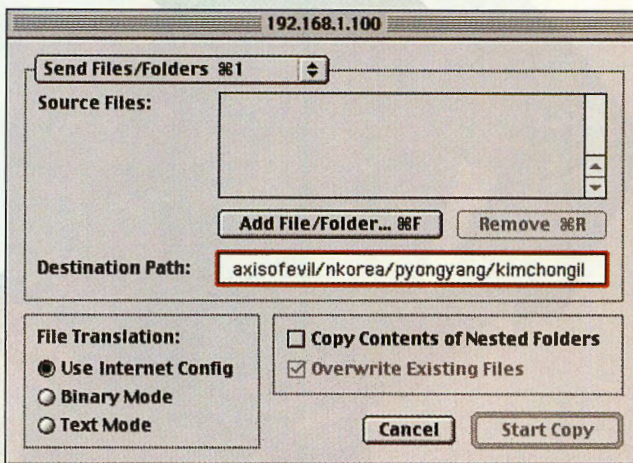
Fortunately, there's a solution: SSH (secure shell). Built into OS X and available in many shareware, freeware, and commercial flavors for OS 9, SSH lets you encrypt communications sent to your Mac, so those pesky snoopers along the way can't peek. The easiest way to use SSH is to allow remote log-in on the machine you want to access, then connect

to it from a remote OS X Mac by simply typing `ssh the machine name` in the Terminal, or in an OS 9 Mac using any program that supports SSH connections (you can download a copy of one of our favorites, NiftyTelnet SSH, for free from [www.versiontracker.com](http://www.versiontracker.com)).

If you need to transfer files, SSH provides mechanisms called SFTP (secure file transfer protocol) and SCP (secure copy). SFTP is by far the easier to use—it works much like traditional FTP. To use SFTP, either type `sftp the machine name` in a Mac OS X Terminal window, or use a graphical SFTP client (currently we're aware of only one: MacSFTP, [www.macssh.com](http://www.macssh.com), \$25). NiftyTelnet has an SCP client, but that's a bit trickier to use, as it requires you to type a Unix-style path name for the target transfer folder. SSH has a wide range of other uses, as well—check out Kimmo Suominen's excellent intro ([www.tac.nyc.ny.us/kim/ssh/#public-key-crypto](http://www.tac.nyc.ny.us/kim/ssh/#public-key-crypto)) for more.



NiftyTelnet is a simple, effective, no-frills SSH client for Mac OS 9.



NiftyTelnet's SCP file-transfer support is not as easy to use as MacSFTP's—but it gets the job done.

**Router** Either a hardware device or a combination of hardware and software, a router sits between two LANs or networks and determines the best route for any particular packet traversing from one IP address to another. Since it operates at a deeper network layer than a bridge does, a router needs to work both smarter and harder.

**Server** Strictly speaking, a server is any device that provides services—files, mail storage, network identities—to other devices on a LAN or larger network. In common usage, though, a server is usually a centralized device that other computers access for a designated purpose, such as file storage.

**SSH (secure shell)** This application enables you to log on to another computer remotely to diagnose problems, quit applications, and transfer files. It uses highly secure forms of authorization and communication to prevent hacking.

**Static IP address** If your ISP assigns your computer a static IP address—that is, one that's permanent and unchanging—you can provide that address to others, who can then reach your Mac directly over the Internet, allowing Web-page access, for example.

**Switch** Like a hub, a switch is a central device to which a number of computers or LANs connect and through which they communicate. Unlike a hub, however, a switch sends packets directly to the target computer rather than simply broadcasting them over the entire network, as a hub would do. As a result, each computer has access to the network's full amount of bandwidth. Plus, switches can operate in the much more desirable full-duplex mode, as opposed to hubs—but they're worth it.

## TCP/IP (Transmission Control Protocol/Internet Protocol)

Originally tested on Unix systems in the early 1980s, TCP/IP is a set of protocols that have become the universal language of the Internet, as well as the communications standard for Mac OS X and a host of other operating systems. Although TCP/IP comprises several protocols, the two main ones are TCP and IP. In a nutshell, TCP manages the connection between two computers, reassembles packets into the correct order after their arrival, and supervises the resending of data if something goes wrong. IP, on the other hand, handles the data-routing chores—that is, it creates and addresses packets and ensures that they go to the correct IP address.

**Twisted pair Ethernet** networks today largely rely on twisted-pair cabling. It's similar to standard telephone cabling in that it consists of up to four sets of two copper wires with each pair twisted

together, thus reducing electrical noise and interference. The two main types of twisted-pair cable are UTP (unshielded twisted pair) and STP (shielded twisted pair); the latter ~~is a much better choice~~ over the bundles of twisted pairs, which further reduces interference. For most SOHO applications, UTP is just fine.

**Upstream** The direction of data flowing from your Mac to the Internet or any server.

## WEP (Wired Equivalent Privacy)

This security protocol for wireless LANs uses an encryption scheme designed to provide wireless communication with the same amount of privacy as wired LANs—but you probably could have guessed that from its name. Apple's first-generation Graphite AirPort Base Stations used 40-bit encryption; the second-generation Snow models use a much more secure 128-bit system.



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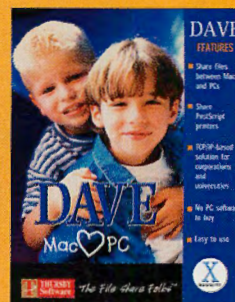
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# DV Magic

by Narasu Rebbapragada  
("Animating DV" by Jill Harrington)

What do the band Nine Inch Nails, the man behind the movie *Waking Life*, and a special-effects guru who worked on *Star Wars: Episode I* have in common? They all used the relatively inexpensive miniDV format and Apple's Final Cut Pro to make their creative visions come to life—proving once again that anything is possible with a Mac.



Find the ReelMotion Simulator 1.03 demo, *The Last Birthday Card* trailer, and the Nine Inch Nails concert trailer on the Disc.





# Animating DV

MiniDV makes the movie *Waking Life* a dream come true

► **R**ichard Linklater's 2001 animated film, *Waking Life*, defies the genre's norms. It's not anime and it's not a cartoon. The 97-minute movie, which won best animated film at the 2001 New York Film Critics Circle Awards, depicts a trippy world where DV lays the foundation for fanciful animated graphics. The story follows a young dreamer, Wiley Wiggins, on a surreal, philosophical journey that may or may not be a dream. On the way, we meet a cast of undulating animated characters, based on real-life actors such as Uma Thurman and Ethan Hawke. The best part? He did it all using miniDV and some Macs.

## Richard Linklater

Richard Linklater boosted the visibility of independent films with his 1991 Sundance hit, *Slacker*, a movie about a day in the life of Generation X misfits. He championed misunderstood youth with the film *Dazed and Confused*, about the last day of high



school set in the '70s, and the bleak flick *SubUrbia*, about teens growing up.

## MiniDV Flies High

Linklater and his crew of three started the filming process in the summer of 1999 with two Sony DCR-TRV900 handheld miniDV cameras. To get tracking shots from above, they mounted a small Sony DCR-PC1 miniDV camera on a *boom pole*, a long pole that usually holds a microphone. The crew shot the movie in 26 days in New York, San Antonio, and Austin, Texas. The portability of miniDV let them take seemingly difficult shots from locations such as a hot-air balloon for the floating aerial views of Austin.

## Editing for Animation

Linklater and his editor Sandra Adair edited the video on a Blue-and-White Power Mac G3/350 with a whopping 450GB of hard drive space (including a 400GB RAID). They needed it. They had more than 40 hours of footage, which Adair edited down to create the basis of a 97-minute film with the help of Apple's Final Cut Pro 1.0 ([www.apple.com](http://www.apple.com), \$999 for current 3.0 version). To make the process more manageable, she divided the footage into *reels*, 20-minute segments.

Dealing with the audio portion of the movie was a little tricky. During the shooting, a boom operator recorded the actors' voices and live musicians of the Tosca Tango Orchestra on DAT (digital audiotape). Adair then used a Pro Tools digital-audio production system to convert the audio to Sound Designer II (SDII) files, a format Final Cut Pro could handle. She transferred the audio files to her computer and synced them with the video—no small task given the amount of footage involved. Adair treated the actual video as the finished product, even though her real-life movie would soon be transformed into an animation.

## Ready, Set, Animate

Editing the miniDV video was only half of the creative battle. The other half was animating it. Bob

Sabiston, the movie's animation director, led a team of 31 animators, who worked on 16 Mac G3s and G4s. With so many people working on one project, he wanted to make sure the animation had a consistent look, so he actually *cast* each artist to work on a specific character in the movie.

Sabiston converted Adair's edited footage into a series of QuickTime shorts and lowered the resolution to 416 by 234 dpi, to save disk space and speed up the animation. Next, the team enlarged the QuickTime video to display at 832 by 468 dpi (essentially doubling the dimensions) so they could work on it. They used Mac-only custom software, which Sabiston himself created (sorry, not available to the public), to animate the QuickTime movies. Sabiston named the software *Rotoshop*, referring to the animation process of *interpolated rotoscoping*.

The process worked like this: The artists used a Wacom tablet with a pressure-sensitive pen to paint lines and shapes in layers on top of the video frames. But they didn't have to draw on each individual frame. Instead, they used the arrow keys to skip ahead a few frames, thereby drawing on nonconsecutive video frames. The software *interpolated*, or drew in, brushstrokes on the interim frames. Animators could also interpolate color, causing a brushstroke's color to fade from one color to another between frames. While the



Linklater and crew used miniDV cameras like this Sony DCR-TRV900 during the shooting phase of the project.





animators could turn off the interpolation mode if they wanted more control over what they were drawing, the interpolation created the animation's near-constant flow. "It's a weird mix of computer and natural drawing," Sabiston says.

Since many of the artists had never done animation before, Sabiston simplified the process by programming most alphanumeric keys to perform a specific function. Pressing Q, for example, turned off the video so only the animation appeared. When animators finished animating their scenes, they selected Write Out Scene from the File menu, and the computer added the scene to the master DV file, kept on a computer they affectionately named Hedgehawg. Why Hedgehawg? Sabiston had just visited an international short-film festival in the city of Hamburg, Germany, where little hedgehogs run around the streets instead of rats. The phonetic spelling mimicked the accent of one animator from Mississippi.

To save time, the crew animated every other frame of DV at 12 fps. Then they doubled every film frame, creating an effect much like shooting the same film cell twice, ending up at 24 fps for the final version. Despite the shortcuts, the animation process was not for anyone with a short attention span. It took about nine months to complete, with approximately 150 hours of work spent on *each minute* of finished animation.

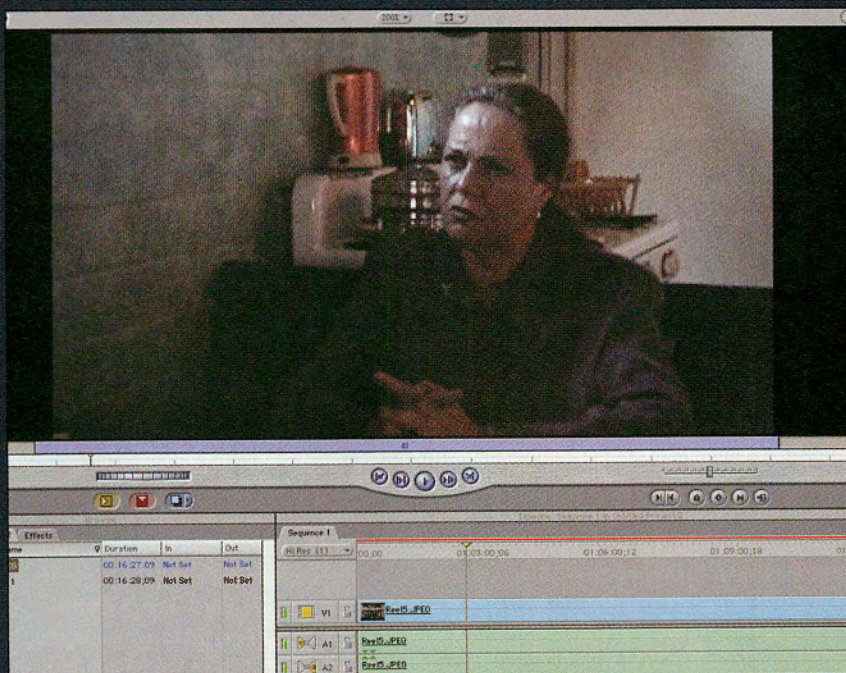
## Slow and Steady Goes to the Festival

Sabiston finished the movie in the ubiquitous PICT format. He then converted the PICT files to TIFF, which PC-based company Swiss Effects needed to transfer the movie from DV to 35mm film. The company shipped back the finished high-definition film just in time for *Waking Life* to premiere at the 2001 Sundance Film Festival, where it received accolades.

## Film Versus DV: What's the Difference?

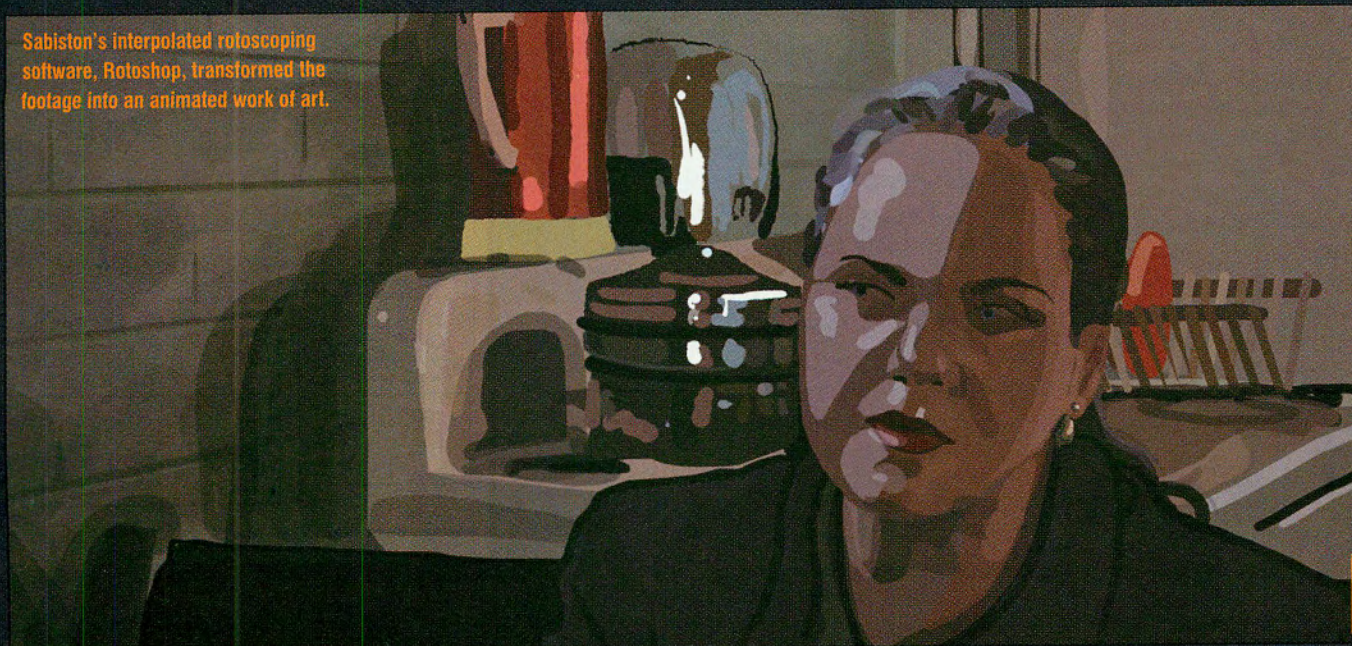
Did you ever notice that the movies you see in theaters have a softer, richer look compared to your home videos, which are sharper, flatter, and less comforting to the eye? The difference, besides tens of thousands of dollars' worth of equipment, is that filmmakers shoot movies on *film* (including 8mm, 16mm, 35mm, 70mm, and Imax formats). You, on the other hand, shoot video.

Frame rate is one small but important difference between film and video. Film has a frame rate of 24 fps, while video has a frame rate of 29.97 fps. Since each frame in video interlaces two fields, you're really getting about 60 images per second, which is all the human eye can process. Video, to our eye, is nearly indistinguishable from real life, which is what gives it that reality feel we associate with news broadcasts. Ironically, film's lower frame rate is what gives it a more professional, cinematic look. "Film shows us a lot less, and therefore invites us to creatively participate by filling in the blanks," says indie filmmaker Stuart Maschwitz (see "Special FX," p42). "It's weird. Video shows you more, but it looks like less."



Adair edited Linklater's miniDV footage in Apple's Final Cut Pro 1.0 and synced it with the audio to prepare it for the transformation to animation.

Sabiston's interpolated roto-scoping software, *Rotoshop*, transformed the footage into an animated work of art.





# Special FX

A former ILM guru adds explosive special effects to his short film

**A** movie about an artist who moonlights as a professional hit man is a pretty kooky idea. The fact that it includes exploding helicopters—yet cost only \$5,000 to make—is even weirder. *The Last Birthday Card* is a 15-minute short directed by Stuart Maschwitz, cofounder of The Orphanage and former special effects wiz for ILM. This film received praise for its special effects, including the helicopter scene we'll outline here. It also featured a process called Magic Bullet, which gives DV the look of film at a fraction of the cost ([www.toolfarm.com](http://www.toolfarm.com), for \$995).

## Stuart Maschwitz

As a visual-effects supervisor at George Lucas's Industrial Light and Magic (ILM), Stuart Maschwitz worked on hits like *Mission Impossible* and *Star Wars: Episode I*. Maschwitz eventually left ILM, along with two others, to found The Orphanage. Since then, his company has created several films featuring stars like Minnie Driver and Mimi Rogers, and has received accolades at Sundance.



## Surreptitious Shooting

In keeping with the indie-film tradition, shooting of *The Last Birthday Card* had to be done quickly and sometimes on the sly (you can watch the film's trailer at [www.theorphanage.com](http://www.theorphanage.com) or on the Disc). "I was actively supervising the shots for *Star Wars: Episode I—The Phantom Menace* [at the time], so it was an evenings and weekends type of project," Maschwitz says. He relied on the portability and diminutive size of the Sony VX 1000 miniDV camera; while bigger than the average consumer camcorder, it's tiny compared to a film camera.

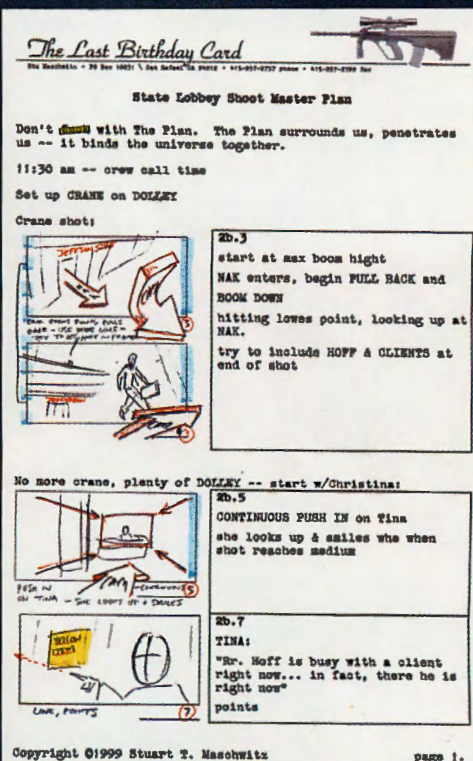
Maschwitz shot the film in San Francisco. To get some establishing shots of downtown, Maschwitz drove around the city on his lunch hour with the tripod set up in the back of his pickup truck. Armed with a small LCD monitor stuck to the dashboard, a cable, and a remote control, Maschwitz simply started taping when he saw a shot that looked good. In fact, Maschwitz shot an assassination scene at San Francisco's Hotel Maxwell, although the hotel staff never knew it. "We just got a room and had [bellhops] bring up our suitcase," Maschwitz says. "Little did they know it contained all of our studio equipment."

## They Want FX

In one scene, a giant helicopter swoops down in front of an apartment window and opens fire. While it may look realistic, the helicopter was actually a model. Before building the helicopter, Maschwitz visited an airplane museum in Tucson, Arizona, and took pictures of a particular helicopter. He then used those photographs as reference images to build a digital 3D model. He bought the bare bones of the model for about \$500 from Viewpoint ([www.viewpoint.com](http://www.viewpoint.com)), and then painted and textured it into the killing machine you see in the movie.

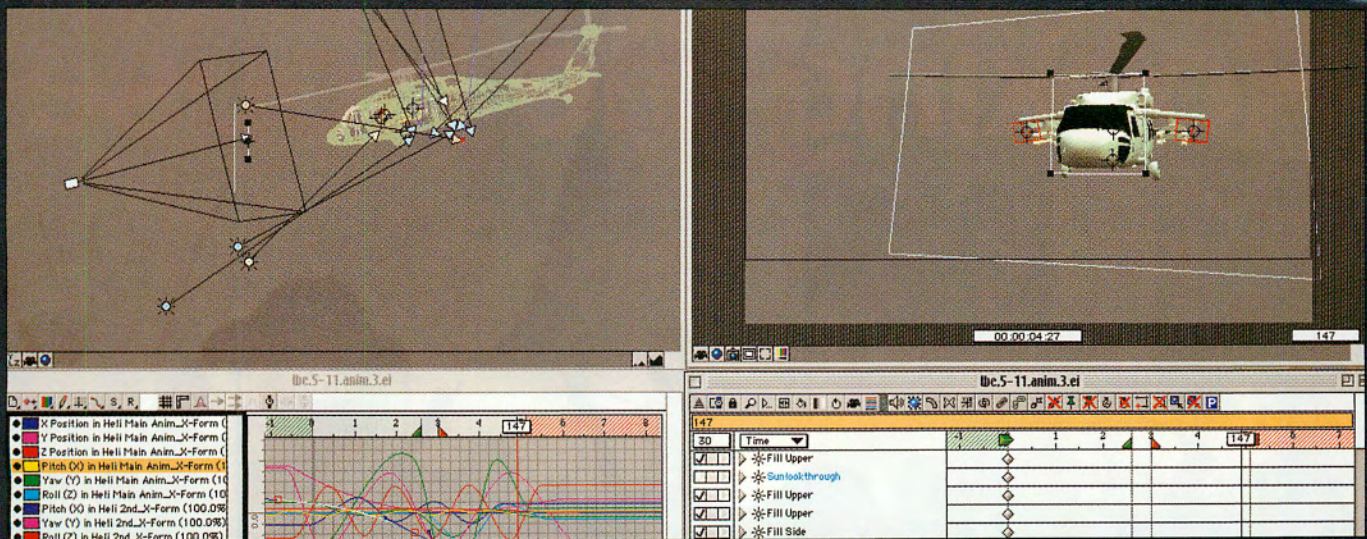
Maschwitz likens executing visual effects to being a stage magician. "You wave something over

there while pulling a rabbit out of your sleeve here," he says. For instance, Maschwitz staged the helicopter sequence so the audience sees the helicopter approach the building through the apartment window. You think you're seeing a huge helicopter, complete with a monstrous steel frame and rotating blades. In fact, you see very little of the actual model. Maschwitz intentionally made the helicopter wash out in the bright light of the window, since viewers wouldn't notice much from that angle and lighting. The ego-blowing decision to show only what's needed takes some guts when



Every good movie begins with a good plan, like this storyboard for *The Last Birthday Card*.





Maschwitz bought a bare-bones helicopter from the Viewpoint library and modeled it in Electric Image.

you've spent all that time modeling and texturing and animating a 3D helicopter, Maschwitz says.

The lack of detail is both a bummer and a blessing. "There's a lot of little subtle details in there—heat ripples coming out of the engines and things like that—but there are just as many places where I totally cheated, and hopefully you don't notice that," he laughs. For instance, one assassination scene looks like it's taking place in downtown San Francisco. In reality, the scene features an office building in downtown Oakland (where it's cheaper to film), with the San Francisco Financial District placed behind the building.

## Putting It All Together

Once Maschwitz shot the footage and modeled the helicopter, he put everything together using Electric Image Animation System, now renamed Universe 4.0 ([www.electricimage.com](http://www.electricimage.com), \$995); Adobe After Effects ([www.adobe.com](http://www.adobe.com), \$649); and Apple Final Cut Pro. Electric Image is where Maschwitz animated the helicopter. "You try to think like a helicopter. You sit with your DVDs of every movie ever that had a helicopter in it, and you study all the subtle motions of the thing," he says of the process of making the helicopter's movements look realistic. For realistic movement in vehicles, Maschwitz recommends Rainbow Studios' ReelMotion ([www.reelmotion.com](http://www.reelmotion.com), \$400), a physics simulator that can create a realistic animation, then import it into a program like Electric Image. In After Effects, Maschwitz adjusted the color, exposure, and focus to make the helicopter look as if it were actually in the video scene.

Maschwitz integrated the movie's building blocks—the animation, video, and music—in Final Cut Pro using a Blue-and-White G3/300. He mocked up scenes in Final Cut Pro using stock sound effects, raw video clips, and placeholders (called Shot Missing Cards) where the special effects should appear. He used this process in the helicopter scene to calculate that he needed five

special-effects shots of the helicopter. He quickly created *animatics*, rough animated storyboards, in Electric Image and After Effects. Back in Final Cut Pro, Maschwitz cut in the animatics to see if the pacing of the scene seemed right.

The helicopter scene required working in all three applications simultaneously, polishing each piece until the scene came together. "We go back into Electric Image and make sure the animation is just perfect and the textures just right, and we go back into After Effects and make sure all the compositing is just right, and after that it's plug and play," Maschwitz says. "You just start dropping the final shots into your timeline in Final Cut Pro."

## Onward and Upward

*The Last Birthday Card* is proof that it's talent—not the wealth of a Donald Trump—that produces good movies (though having deep pockets does help). The Digidance Film Fest, the Slam Dunk Film Fest, and the AFI DV Symposium received *The Last Birthday Card* well. The Orphanage used it as a springboard, going on to produce six other shorts, including the movie *Sweet*, which won honorable mention at the 2001 Sundance Film Festival.

## Cheap Substitutes

Even if you're on a tight budget, Maschwitz says there are many ways to get around money restrictions and still produce a high-quality film.

- Shoot during daylight hours to maximize natural light and minimize the use of expensive lighting equipment.
- For smooth pans and cheap dolly shots, attach your tripod to some device on wheels, like a gardening wagon.
- If you can't afford professional-grade 3D models at Viewpoint, try Turbo Squid ([www.turbosquid.com](http://www.turbosquid.com)), which sells 3D models for as little as \$25.
- The ReelMotion application and Electric Image plug-in cost \$400 altogether, but the save-disabled free demo (on the Disc) lets you import 3D models into ReelMotion and watch how your vehicle runs.



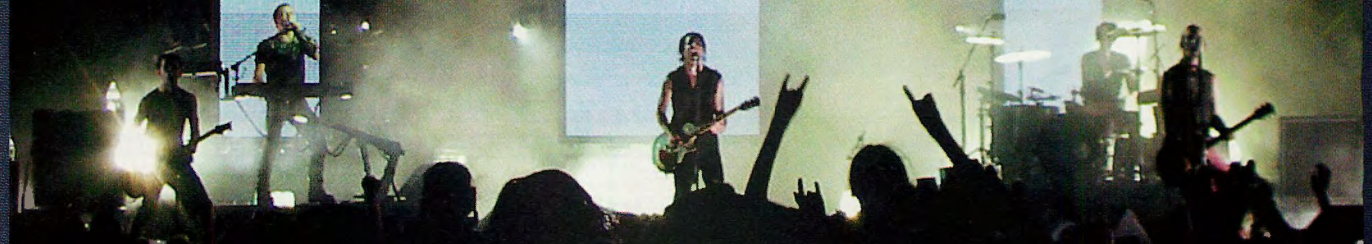
Duck! It's our finished helicopter, looking a little too real.





# Rocking the House

PHOTOGRAPH BY ROB SHERIDAN (©2000 NOTHING RECORDS)



MiniDV captures the authenticity of a Nine Inch Nails concert tour

“It looked like a bad HBO special,” says Trent Reznor. The lead singer for the popular rock band Nine Inch Nails is referring to an old concert video that a professional film company shot. So when creating the *Nine Inch Nails Live: And All That Could Have Been DVD*, which chronicles the band’s 2000 *Fragility V2.0* U.S. tour, Reznor tried a different approach for capturing the chaos of a live show: He and his crew did it themselves.

## Trent Reznor

Trent Reznor is the lead singer and front man of the platinum-record, Grammy-winning rock band Nine Inch Nails, whose heavy and often discordant electronic music often gets pegged as industrial. While the band’s success is undisputed, its music often is. Its controversial lyrics and visuals caused most media outlets to ban at least one of its videos.




## Camera in the Crowd

Reznor’s crew used eight miniDV cameras, including Canon’s XL1s and Sony’s DCR-TRV900, to film 20 shows. These portable cameras wandered through dense crowds, zoomed in on band members, and even climbed to new heights. “We played at the Gorge in Washington, which is this really beautiful outdoor venue,” says Rob Sheridan, who edited the video and manages the Nine Inch Nails Web site. “At places like that you immediately start to see, ‘OK, we need to find a place to get a camera up really high on this venue so we can get that shot.’”

## The Effect of No Effects

Reznor’s goal for the DVD was to represent the concerts exactly as the audience saw them, so Sheridan edited the video cleanly and simply, starting off in Apple’s Final Cut Pro 1.0 and finishing in Final Cut Pro 2.0. Although the DVD looks stylized, with colored stage lights and strobes synchronized to pulsing drumbeats, Sheridan did not add any fancy transitions or special effects. He did, however, have to make some moderate color corrections—an inevitability when you have eight cameras negotiating the crazy lighting of concert venues. “There was one song where the Sony cameras and the Canon cameras, for whatever reason, picked up the blue in the lights totally differently, and it literally cut in between two shades of blue,” Sheridan says. “So we would just even that out [in Final Cut Pro].” Incidentally, Final Cut Pro 3’s

Video Scopes tab  three-way Color Corrector filter provide even more ways to correct color.

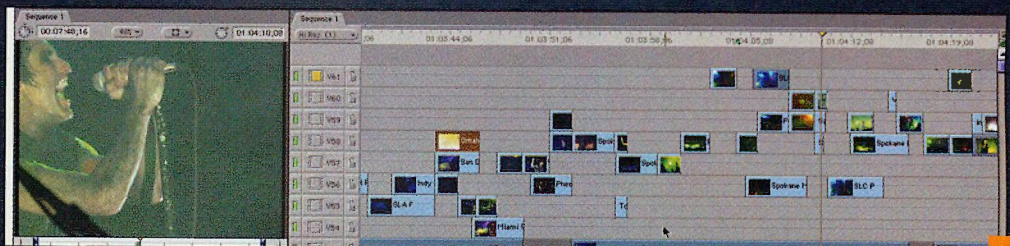
## Step in Time

It took some give and take to match up the concert video and audio, which Reznor recorded professionally, then mixed on a Pro Tools system in a studio. “We’d go back and forth and change the video to make the audio better and change the audio to make the video better,” Sheridan says.

Sheridan’s challenge was to seamlessly match up video from one location and audio from another. On one night, guitarist Robin Finck jumped into the crowd. “I really wanted to use [that shot] in this one song, but it was from a city where they didn’t record audio, so I went down to them in the mixing room and said, ‘Hey, guys, I really want to use this shot. Can you just pull Robin’s guitar part out of that part of the song, because he’s throwing his guitar into the crowd at that moment?’”

## A Successful Experiment

In the end, Reznor learned to his surprise that miniDV, the Mac, and Final Cut Pro were all he needed to re-create the concerts on DVD. In fact, he liked the look of miniDV quite a bit. “It didn’t have the ugly video quality that we weren’t looking for,” he says, “but it had an honesty that video gives.” The *Nine Inch Nails Live: And All That Could Have Been DVD* is available now from retailers including Amazon ([www.amazon.com](http://www.amazon.com), \$27.36 street).



Video editor Rob Sheridan used Apple’s Final Cut Pro to edit live concert footage.



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# reviews

Better living through smart shopping.

## 800MHz G4 iMac

### hardware

X

**Company:** Apple

**Contact:** 800-795-1000 or 408-996-1010, [www.apple.com](http://www.apple.com)

**Price:** \$1,799 (SRP)

9

**Specifications:** 800MHz PowerPC G4 processor with 256K on-chip L2 cache, 256MB RAM, 60GB Ultra ATA/66 hard disk, nVidia GeForce2 MX graphics processor with 32MB DDR RAM, SuperDrive, Apple Pro Speakers



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**YEAH, WHATEVER**

Neither recommended nor rejected. Some might like this, but we weren't impressed.



**BLECH!**

Give us back the time we spent testing this.

X

Compatible with Mac OS X or later.

9

Compatible with Mac OS 9.x or earlier.

PHOTOGRAPH BY W. B. JONES



PHOTOGRAPH BY MARK MADEO

**A**fter living with an 800MHz, SuperDrive-equipped G4 iMac on our desk for the past couple of weeks, we can confidently proclaim that this sleek, revolutionary triumph of industrial design is more than just beautiful—it's one clean, lean, mean, flat-screen computin' machine.

As with its 15-inch CRT-equipped ancestor, unpacking and setting up the new iMac was ludicrously easy—even the efficiency of its foam packing cradle is remarkable. After we freed it from its polystyrene constraints, we—as advised by Apple—lifted it by its sturdy stainless-steel neck, plopped it onto our desk, and were immediately impressed by how little real estate it commandeered. At 10.6 inches in diameter, its base is about 1 1/4 inch wider than an NBA basketball. We were also pleased by the little machine's heft. Although at 21.3 pounds the G4 iMac is

**Yes, it's innovative. Yes, it's beautiful. Yes, you want one. But does it measure up to the hype? You're damn right it does.**

just over half the weight of the original 40-pound G3 iMac, it's plenty heavy enough to support the floating LCD display, even at the most extreme extension.

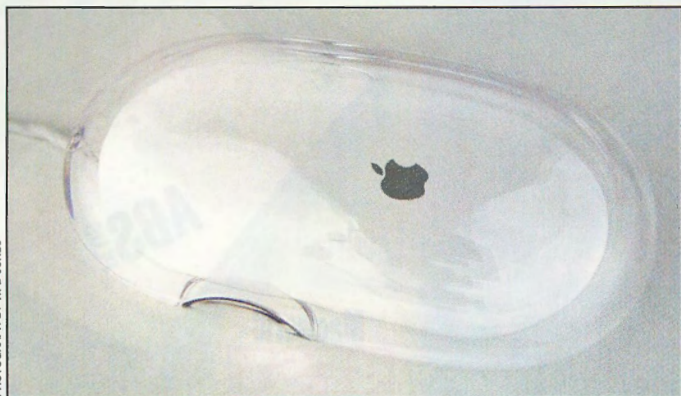
After spending a few moments admiring how much better our office looked with an iMac in its midst, we plugged the all-white, 108-key Apple Pro Keyboard into one of the iMac's three USB ports (more on them later), plugged the all-white optical Apple Pro Mouse into one of the keyboard's two USB ports, inserted the 2.5mm plug for the included Apple Pro Speakers into the Speakers minijack, connected the AC cable (which slips nicely into its small proprietary port, keeping the design clean), found the not-easy-to-locate, flush-mounted power button on the left rear, and fired it up.

**The Apple Pro Mouse fits right in with the new aesthetic. We call it mighty whitey.**

The startup sound from the Apple Pro Speakers was reassuringly rich, but if you really want to take advantage of the iMac's 18-watt digital amplifier to listen to some serious audio, we recommend an iSub (Reviews, Apr/00, p61) or an external speaker-and-woofer setup to enjoy its frequency response of  $\pm 1$ db from 20Hz to 20kHz. We connected our set of Monsoon iM700s (Reviews, Nov/00, p60) to the 3.5mm headphone-and-speaker jack, popped Zappa's *Yellow Shark* CD into the do-everything SuperDrive, and blew the room away. Don't try to plug non-Apple digital speakers into the 2.5mm Speakers minijack—a ROM in the Apple Pro Speakers identifies them to the iMac. Apple wants to unload more of those speakers, we guess. Leftovers from the days of the Cube?

Connecting to the Internet was equally idiotproof. We used a cable-DSL router connected to our Ethernet network—the iMac provides 10/100Base-T through its RJ-45 jack—but we also tested the built-in modem, which supports both the V.90 and K56flex standards. It worked like a champ.

A further word about the modem: Inside the iMac are two independent USB controllers (known also by the decidedly Anglo-Saxon term of *root hubs*). One of these hubs supports both the internal modem and an external port (the one





closest to the iMac's mini-VGA adapter); the other hub supports the other two external USB ports. The keyboard, by the way, is a bus-powered USB hub—neither of its two ports provides enough power to connect a second bus-powered hub. One final “by the way” note: The mini-VGA adapter is the same type used on the iBook, so you’ll need an iBook VGA Display Adapter (\$19 at your local Apple Store or [www.apple.com/store](http://www.apple.com/store)) to connect a separate monitor—which can only mirror video, by the way. Yeah, so that’s another “by the way.” So we lied.

After surfing the Web for a bit, we noticed that the intensely bright, exceptionally crisp LCD screen was now reflecting a bit of glare from our office window as the afternoon sun rose. No problem—we gently changed the LCD’s angle by lifting its clear plastic halo, and the glare vanished. The easy adjustability of the iMac’s display—it tilts from  $-5$  to  $+30$  degrees, raises and lowers over 7 inches, swivels 180 degrees, and remains readable from 120 degrees horizontally and 90 degrees vertically—solves a load of ergonomic problems, from eyestrain to back and neck pain.

We did notice one niggling little problem



The iMac's spring-loaded neck is a frictionless wonder of modern engineering.



PHOTOGRAPH BY W. B. JONES

**Hunt-and-peck typists rejoice! White keys are much easier to read than traditional black ones.**

with the display, however—and although it’s so tiny we’re almost embarrassed to mention it, it’s enough to detract from the promise of design perfection that the iMac embodies. The display tilts. A little to the right. About  $1/4$  inch. It feels as if the right side of the display, where the power-on light is located, is a bit heavier, and the slight play in the neck connection allows the extra weight to drag down that side a wee bit. We wouldn’t have even noticed it, but our office has venetian blinds, and the iMac’s display is clearly out of phase with their horizontal regularity. Yeah, we told you it was a minor quibble—but it still bugs us.

Our initial once-over established that the iMac was beautiful, that its setup was extraordinarily simple, that it sounded great, and that its 15-inch LCD display—which has a viewable area close to that of a 17-inch CRT—was bright and crisp at its native 1,024 by 768 (75MHz) resolution, and acceptable even at its nonnative resolutions of 800 by 600 and 640 by 480. But how does it perform? Very well indeed, thank you.

As a consumer-focused machine, the iMac can’t be expected to hold its own when pitted against pro behemoths such as the Dual 1GHz Power Mac G4 (*Reviews*, this issue, p48), but it manages processor-intensive consumer tasks, such as ripping MP3s in iTunes and rendering videos in iMovie, with speed and aplomb. When we encoded a 1-hour DV iMovie with a fair number of transitions and titles into the QuickTime format used by iDVD, the process took just under 2 hours. That may sound like a long time, but try to complete the same task on a Pentium 4 machine and you’ll wish you’d never started—it can take nearly twice as long. The Velocity Engine—aka AltiVec—in our iMac’s 800MHz PowerPC G4 accelerates such processes greatly.

Day-to-day productivity tasks were snappy as well. Finder windows popped open quickly and dragged, resized, and minimized smoothly. Microsoft Office v. X ran without a hitch. With the help of the iMac’s nVidia GeForce2 MX graphics processor, Otto Matic ran smooth and well-detailed rings around his vegetable opponents. Even our beta version of Photoshop 7 (see “The Magnificent 7,” Apr/02, p12)—which the folks at Adobe had warned us would run slowly—worked plenty fast for straightforward image editing on files that fit comfortably within the iMac’s 256MB of RAM. Nice.

Speaking of RAM, we recommend that you order your iMac with a full 512MB of RAM installed in its 168-pin PC133 DIMM slot, which you can’t access yourself without voiding the warranty. Have the folks at Apple fill it up for you for an extra \$200. Then you can fill the other slot (a user-accessible, 144-pin affair) with another 512MB, bringing your iMac to its maximum 1GB of RAM. Remember, nothing improves performance more than RAM—especially in Mac OS X.

When you take off the circular aluminum plate on the iMac’s underside to install that SO-DIMM (that’s where you can also install a \$99 AirPort card), check to see if the little red LED there is lit. If it is, stop immediately. Your iMac is powered up. Shut it down before mucking about any further. After all, you don’t want to blow up the coolest computer you’ve ever owned.

—Rik Myslewski

**good news:** Ground-breaking design. Fastest iMac ever. Brilliant 15-inch LCD display. SuperDrive. **bad news:** Limited internal-expansion capabilities. No L3 cache. 100MHz system bus.





# Dual 1GHz Power Mac G4

## hardware



**Company:** Apple

**Contact:** 800-795-1000 or 408-996-1010, [www.apple.com](http://www.apple.com)

**Price:** \$2,999 (SRP)

**Specifications:** Dual 1GHz PowerPC G4 processors (each with 256K on-chip L2 cache and 2MB backside L3 cache), 512MB RAM, 80GB Ultra ATA/66 hard disk, nVidia GeForce4 MX graphics card with 64MB DDR SDRAM and dual-display support, four 33MHz PCI slots, SuperDrive

**J**ust when we were getting comfortable explaining that *megahertz don't matter* to our PC friends, Apple updated its Power Mac line to include a G4 that finally reaches the long-awaited 1GHz milestone. And although Apple broke the gigahertz barrier without the usual Expo-keynote fanfare, the end result is a big deal: This model improves upon the Dual 800MHz model it replaces, with two 1GHz G4 processors, an added 256MB of RAM (for a total of 512MB), an improved dual-display video card, and best of all a \$500 price cut.

Otherwise, it's more of the QuickSilver Power Mac series we know and love, with onboard 10/100/1,000Base-T Ethernet, a 56-Kbps modem, two USB and two FireWire ports, room for 1.5GB of RAM, AirPort

## Bundle Up

**N**ow that Mac OS X is the default startup OS on new Macs, Apple has beefed up its software bundle. Besides the full suite of iApps (iPhoto, iTunes, iDVD, and iMovie), here are some of the goodies you'll find in the Dual 1GHz Power Mac G4's OS X Applications folder:

**Snapz Pro X** for screenshots.

**GraphicConverter 4.1** for everything graphical.

**Art Directors Toolkit** for precision color, font, and layout information.

**PixelNance 1.5** for tweaking digital photos.

**PCalc 2** for scientific calculations.

**Apple's latest Big Gun breaks both the 1GHz barrier and the 2GHz barrier. Life is good.**



PHOTOGRAPH BY W. B. JONES

support, boatloads of software, two audio outs for headphones and optional Apple Pro Speakers—but still no standard (1/8-inch) audio in.

To give this new top-of-the-line Power Mac a chance to strut its stuff, we compared its performance to that of a Dual 450MHz G4 and Dual 800MHz G4. We tested first with iTunes. A few factors play into MP3 encoding besides the processor speed, the most important being how fast your Mac can read data from a CD. Since the read-and-write-everything SuperDrive has a slower CD-read speed than the CD-RW in the Dual 450MHz G4, the new machines actually lagged behind the old when it came to encoding MP3s.

We ventured next into the exciting and fast-paced world of moviemaking. The Dual 1GHz has spectacular video chops, shaming those of even the fastest PC, but encoding QuickTime movies can still take some time. The new machine munched its way through our summer blockbuster faster than we could yell "I'm king of the world!" and shaved precious minutes off the time its slower siblings took for the same task.

Since we did all our testing in Mac OS 10.1, what better high-end application to use for speed testing than Final Cut Pro 3.0, Apple's latest release of its popular professional video editor? Besides, the ubiquitous performance-benchmark application, Adobe Photoshop, isn't OS X compatible yet (see "The Magnificent 7," Apr/02, p12). With our video ready and our three machines warmed up, we set them to

rendering our full-length MiniDV clip. We were surprised to see that the Dual 1GHz didn't outperform its closest competitor by a wide margin. While the Dual 1GHz took a full 30 percent less time to finish rendering than did the Dual 450MHz, the Dual 800MHz held its own by shaving 25 percent off the latter's render time. These numbers are significant if your ability to churn out work fast directly impacts your income; a 30 percent time savings adds up to nearly 2 1/2 hours out of an 8-hour day. We were also pleased to see no dropped frames on the Dual GHz when we used Final Cut Pro 3.0's real-time effects—not a problem with the Dual 800MHz, either, but a common side effect on the Dual 450MHz Mac.

The Dual 1GHz Power Mac G4 is the fastest Mac to date, and it comes with a reasonable price tag of \$2,999. If you've got a single-processor G4 with a 400MHz to 867MHz PowerPC, and you're both creative and impatient, you'd benefit most from this system. However, if you've already invested in any of Apple's dual-processor systems and you can live without the modest speed improvement (5 to 30 percent), you should shell out some small change for a truckload of performance-enhancing RAM (if you haven't already maxed out) and wait until a significantly faster machine comes along.—Brett Larson

**good news:** Megahertz matters again! **bad news:** Dual-processor machines aren't twice as fast as their single-processor counterparts.





# After Effects 5.5

## multimedia

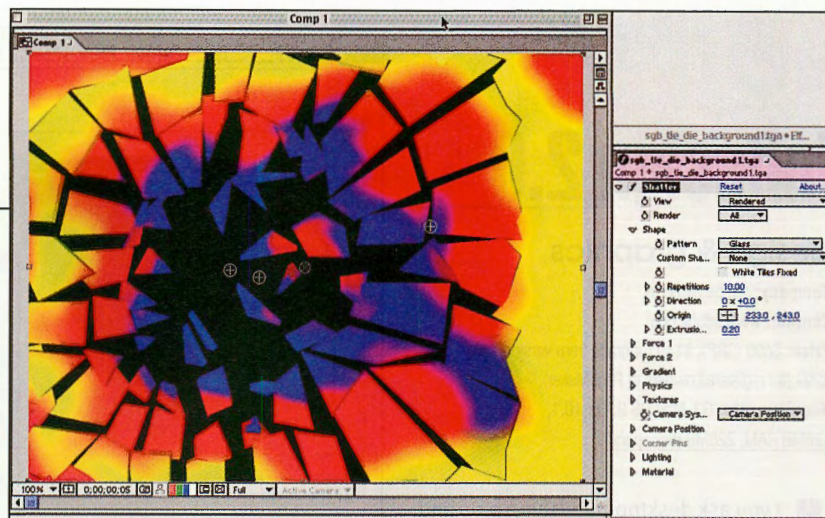
**Company:** Adobe

**Contact:** 800-833-6687 or 408-536-6000, [www.adobe.com](http://www.adobe.com)

**Price:** \$649 standard version, \$1,499 production bundle (SRP); \$99 upgrade from version 5.0

**Requirements:** Power Mac G3, Mac OS 9.1 or later or Mac OS 10.1, 128MB RAM

**Recommended:** Multiprocessor G4, 256MB RAM, 1GB disk space for disk cache, video-capture and -output hardware, 19-inch display



The new Effects palette puts no end of plug-ins and effects at your drag-and-drop behest.

**W**ith version 5.5, After Effects, Adobe's motion-graphics powerhouse, continues its move into the 3D world—the only realm left for it to conquer. The new features, and improvements on older ones, certainly increase After Effects' usefulness for 3D animators, but Adobe still hasn't quite taken it all the way.

The big innovation in version 5.0 was true XYZ motion for layers—an essential ability for today's vertiginous commercial animation. Unfortunately, Adobe had not quite solved the issue of how to render complex 3D intersections among layers with complete accuracy, and you sometimes saw Z-buffer errors, in which one layer did not render properly against another. The new Advanced 3D Renderer takes care of this; choose it over the standard 3D renderer when you want flawless layer interaction.

3D artists will also like the ability to open customizable, orthographic views of the composition space—a quad-view just like the one in your 3D program. Transparent projection layers and colored

shadows in 3D comps add stained-glass and slide-show effects. Even better, if you get the Production Bundle—the high-end, high-priced version with better toys—you can import and apply camera-motion data from two of the top 3D animation programs, discreet's 3ds max and Alias|Wavefront's Maya. This means you can import footage of a 3D object rendered with a moving camera and add new elements in After Effects 5.5 that remain in perfect visual sync with the moving viewpoint.

After Effects still lacks a high-quality 3D particle system. Its own particles are pretty lame; we still depend on our old copy of KPT Final Effects, a suite of filters now going on six years old. Invigorator, the venerable 3D plug-in included with 5.5, doesn't do serious particles. And we're still waiting for the ability to import textured 3D objects (at least from 3ds max and Maya) right in an After Effects comp.

3D features aren't the only news in version 5.5. In the Production Bundle, the Color Stabilization tool is likely to be the most useful; it fixes footage flicker by

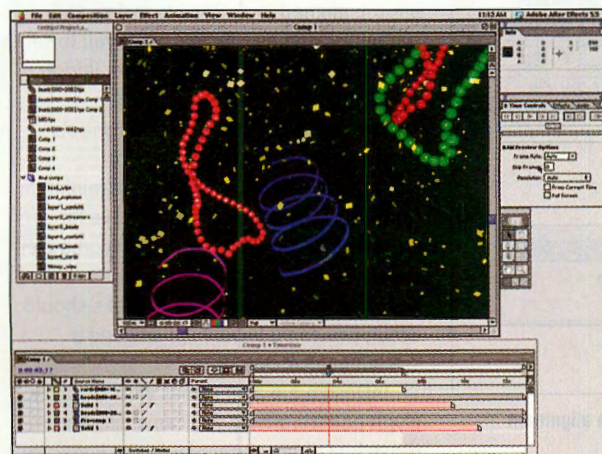
correcting errant frames, with plenty of options and tweakability. You can now keyframe color corrections as well. (We wish After Effects would copy the incredible new color controls in Apple's Final Cut Pro 3.)

After Effects' well-honed interface remains an exemplary machine for channel-based keyframing, and this version has smoothed away a few lingering rough spots. You can now organize plug-in menus your own way in the new Effects palette, and drag an effect from the palette onto the Comp window, the Timeline, or a layer's Effects Control window. Another time-saver: The program now renders and saves frames to disk asynchronously, meaning that it can start rendering the next frame while saving the last one to disk. When you've got 50,000 frames to render and a tight deadline, that could make all the difference.

Need input? After Effects 5.5 takes in just about everything, now including Flash SWF. Want output? Adobe has added RealMedia support, so you can generate RealVideo and RealAudio files for Web streaming with all the usual parameters, including searchable keywords.

After Effects has dominated the desktop compositing market forever—deservedly so—and it's still the champ. Version 5.5 is well worth your investment. But After Effects' undisputed reign may not last much longer. As we wrote this review, Apple announced that it had purchased Nothing Real, developers of Shake, the Emmy-winning postproduction tool many of the top effects houses favor. It won't be long until we see a Mac OS X version of Shake. We hope the After Effects development team is up to the challenge.

—Steve Anzovin and Raf Anzovin



After Effects 5.5 brings improved 3D features while maintaining a time-tested and highly functional interface.

**good news:** Better 3D tools. Fewer Z-buffer errors. Multiple views of layer motions. RealMedia output. **bad news:** Still doesn't import 3D objects. Needs better 3D-particle system.





## InDesign 2.0

### design & graphics

**Company:** Adobe Systems

**Contact:** www.adobe.com

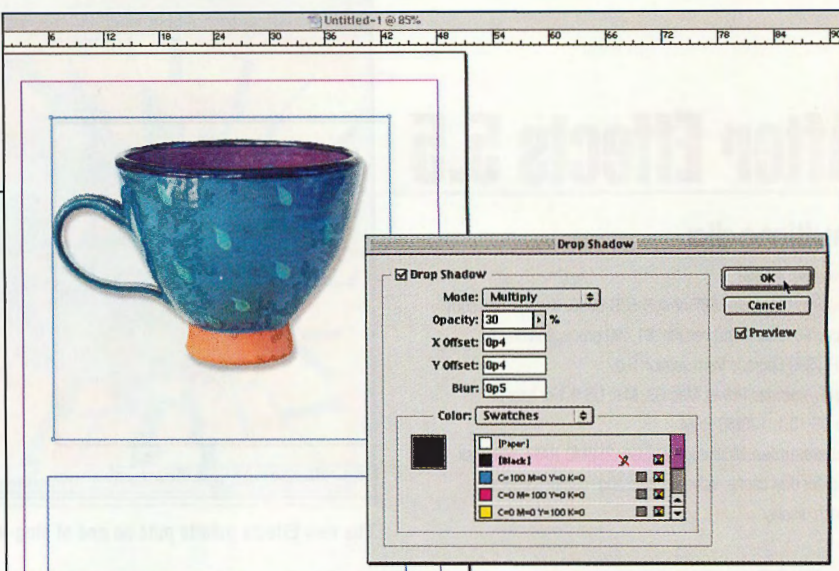
**Price:** \$699 (SRP), \$149 (upgrade from version 1.x), \$299 (for registered owners of PageMaker)

**Requirements:** G3, Mac OS 9.1 or 10.1, 128MB RAM, 220MB disk space

If you ask desktop-publishing pros and major publications what page-layout program they use, nine out of ten will say QuarkXPress. But perhaps we should wait and ask them again in a year. InDesign 2.0, Adobe's intended Quark killer, is OS X ready, compatible with all your favorite programs, and chock full of professional utilities and new functions that will pique your curiosity and perhaps inspire you to lay out your next project within its revamped windows.

For Adobe lovers who already worship the likes of Photoshop and Illustrator, converting to InDesign will be a snap. It has recognizable palettes, similar tools, and the familiar nuances of Adobe's other programs.

InDesign 2.0 offers the ability to open your old QuarkXPress 3.3 to 4.1 files, as well as Adobe PageMaker 6.5x to 7.0 ones, leaving you little excuse not to at least give



Create your drop shadow using InDesign, and it will remain fully editable until you are completely satisfied.

it a try. Of course, old habits are hard to break, which is why you can set InDesign's keyboard shortcuts so they're identical to those of QuarkXPress.

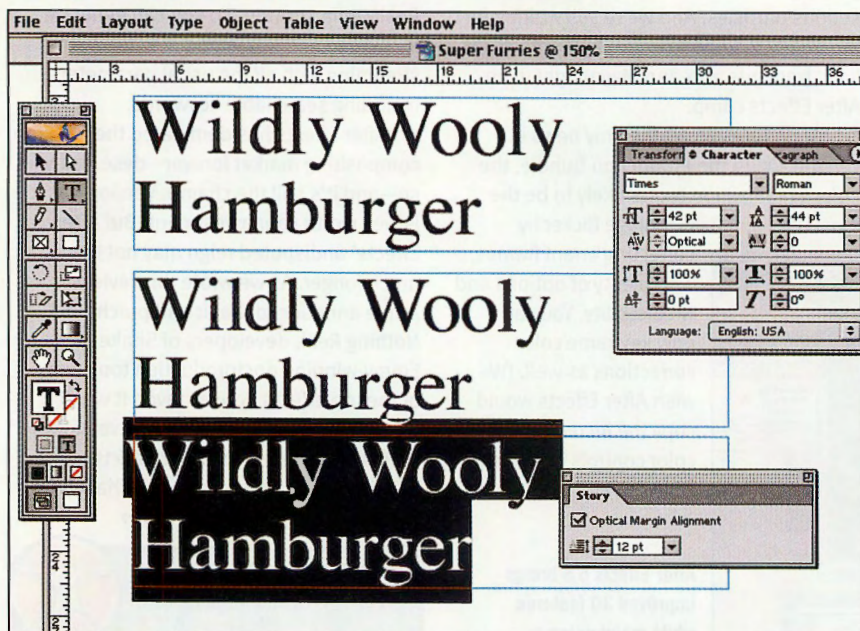
One of the advantages of joining the Adobe matrix is the seamless integration among its sibling programs. An example of this is how InDesign incorporates one of Illustrator's most popular features, transparency. With this extraordinary function you can layer objects, images, or text even when they contain gradients; you just set the desired percentage of transparency to see through each object to what lies below.

Gone are the days of adding the drop shadow in Photoshop and importing it into your page-layout program, only to realize the shadow isn't in the right place, so you have to open the layered file in Photoshop again to fix it. Instead, you add your drop shadows or feathering with InDesign, and the effects remain fully editable at all times. Because InDesign preserves the transparency of Photoshop and Illustrator files, you don't even need a clipping path or layer mask anymore.

InDesign 2.0 is a typographer's dream; its typesetting controls put Quark's to shame. Kerning tools come in metric, manual, and optical, providing you the utmost control over letterspacing—especially useful when you're combining different fonts. Another feature is the optical margin-alignment control. This allows you to keep characters such as the wily letter W and punctuation marks from hanging outside the text's margin, giving it a more aligned look. The character- and paragraph-styling palettes allow you to set and save specific styles, and later import them into other documents.

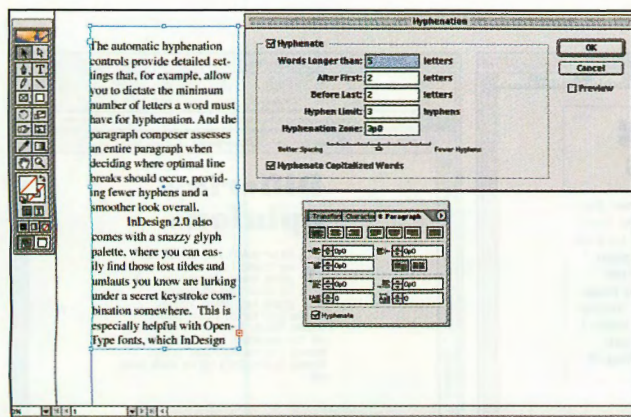
The automatic hyphenation controls provide detailed settings that, for example, allow you to dictate the minimum number of letters a word must have for hyphenation. And the paragraph composer assesses an entire paragraph when deciding where optimal line breaks should occur, providing fewer hyphens and a smoother look overall.

InDesign 2.0 also comes with a snazzy glyph palette, where you can easily find those lost tildes and umlauts you know are



Type geeks rejoice: Thanks to optical kerning (center and bottom) and optical margin alignment (bottom), you can mind your ps and ws. Compare with the raw text, top.





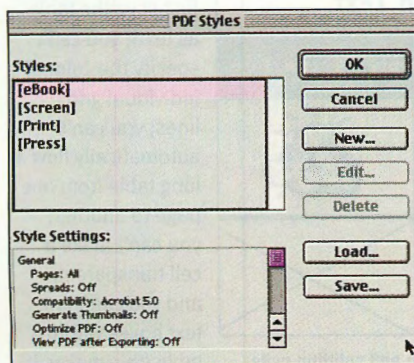
InDesign's hyphenation controls are unparalleled.

lurking under a secret keystroke combination somewhere. This is especially helpful with OpenType fonts, which InDesign now recognizes; these fonts often include a bevy of extra features such as ligatures, swashes, and true fractions.

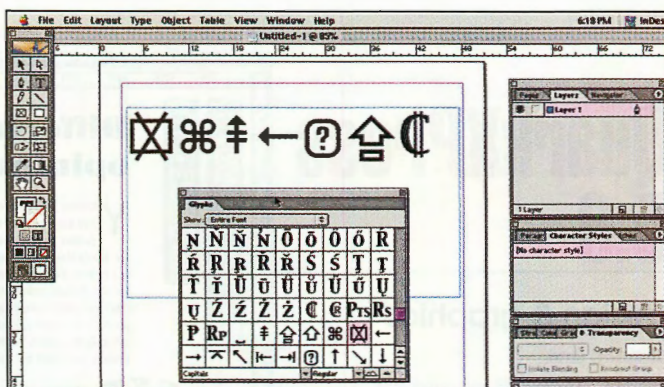
If you need a page-layout program to design a book, take advantage of InDesign 2.0's long-document features. InDesign can cull various documents and amalgamate them into a Book File that shares styles and swatches. From there, the program can sequentially number the pages and create a table of contents with formatting based on your own paragraph-style settings. Finally, InDesign does the grunt work of building an index, which can range from a simple keyword list to a complex cross-referencing tool.

Another advantage InDesign has over QuarkXPress is the ability to import styled tables from Microsoft Word and Excel. You can also build your own tables with ease. InDesign uses rows and columns to create cells in which you may place text, inline graphics, or other tables.

One of the nicer features of InDesign's table builder is the ability to import tab-delimited text. In other words, if you import tabbed text from a word processing



Export to an eBook PDF and maintain live links in the table of contents and index.



InDesign's Glyph palette makes it easy to find those hidden umlauts and ligatures.

program into an InDesign table, InDesign will automatically place each chunk of text that follows a tab into its own cell.

Not only can InDesign create print layouts for magazines and newspapers, it also takes the lead by creating Web output in HTML and XML, and by working seamlessly with Adobe GoLive (Quark's Web solution is to start fresh in a new Web Document—it lacks a simple export feature). Other output options include SVG (Scalable Vector Graphics) and Adobe PDF, including the taggable variety known as eBooks, which contain live links to both the table of contents and the index.

Version 2.0 incorporates the much-needed preview mode to show you exactly how the page will print, and offers the ability to print to a non-PostScript printer.

You can check your font and image usage, as well as color and print settings, in the preflight window.

We're not going to say InDesign is universally better than QuarkXPress—that ultimately depends on your needs. If you're committed to using the best tool for the job, InDesign 2.0 is rock solid and OS X ready—and quite possibly it spells the end of your love-hate relationship with Quark.

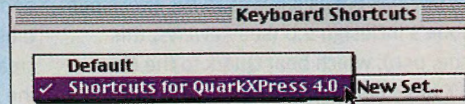
—Leigh Webber

**good news:** Excellent typography tools. Maintains transparency from Photoshop and Illustrator files. Enhanced table and book-design features. **bad news:** RAM hog. Difficult for those who fear change. InDesign 1.x plug-ins not compatible.



## The Quark Quandary

**N**ow there is a viable alternative to the overweight gorilla of publishing (aka QuarkXPress), the question is, which one is really better? That all depends on where you're coming from.



You can change InDesign's keyboard shortcuts to mimic those of QuarkXPress.

### Here's a short list of features you'll find in InDesign but not in Quark

- Object transparency
- Multiple undos
- High-resolution display of imported pictures
- Paragraph-based text composition
- Multilanguage support
- Hanging punctuation
- Support for OpenType fonts
- Multiple views of a document
- Can import formatted tables from Word and Excel
- Preflight utility
- Palette-management features
- Adobe style and function
- Mac OS X compatible

\*contributed by John Cruise

### To be fair, Quark also has some unique tricks up its sleeve, including:

- Support for multiple ink colors
- Custom line styles
- Shape-merging options
- Ability to edit kerning and tracking tables
- Item-specific trapping
- Stranglehold on the publishing industry
- Devoted community of XTension developers
- Familiarity and comfort
- Um...er...hmm...that's about it



## QuarkXPress 5.0

### design & graphics

9

**Company:** Quark

**Contact:** 303-894-8888, [www.quark.com](http://www.quark.com)

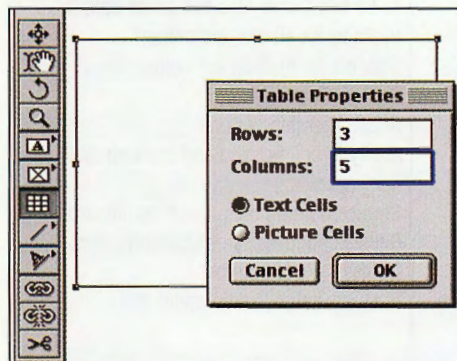
**Price:** \$899, \$299 upgrade from version 4

**Requirements:** Power Mac, Mac OS 8.6-9.x, 14MB RAM (20MB or more recommended)

It's been almost 15 years since the release of the first QuarkXPress.

Since then, the program has evolved from an upstart wanna-be to the undisputed leader in the page-layout arena. This January, Quark took the wraps off QuarkXPress 5.0, an upgrade armed with several useful new features the program's users have been requesting for years. To our chagrin, OS X support isn't among those new features.

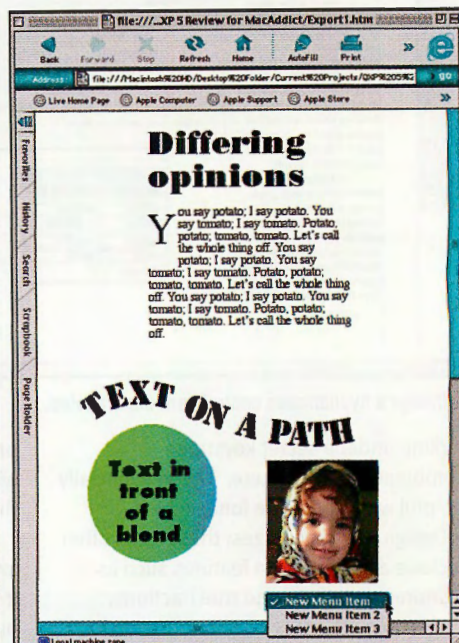
Make no mistake about it, QuarkXPress 5.0 is a formidable program—but it's also a mixed bag. If you see the proverbial glass of water as half full, you'll find that the new features make a solid program even better. If you tend to see the glass as half empty, you'll be disappointed that Quark didn't push the envelope a bit further when it built QuarkXPress 5. If you reckon the glass is just twice as big as it needs to be, check out Adobe's InDesign 2.0 (see *Reviews*, this issue, p50), which beat Quark to the Mac OS X table and has a hungry eye on the old-timer's lunch. (And it's not just an OS X thing, either: We know a few OS 9 holdouts who prefer InDesign.)



Though the new Table tool is great for basic tables, more-complex tables require a little effort on your part...



Quark 5 does Web pages: A Quark Web document in a browser (right) looks remarkably similar to the original in Quark (left).



### Half Full: What's New in Quark 5

**Tables:** QuarkXPress has never had much in the way of table-making capabilities. In previous versions of the program, users had the choice of creating tables manually using tabs, paragraph rules, and lines—a laborious and time-consuming process—or purchasing a table-making XTension (a third-party plug-in).

In QuarkXPress 5, you create a table as you would any other item: Choose the new tables tool in the Tools palette, then click and drag a rectangle that defines the table's size and shape. Each time you create a table, a dialog box lets you specify the number of rows and columns and choose between text cells and picture cells. You can also create a table by selecting text and then using the Convert Text To Table

command. (The Convert Table To Text command reverses this process.)

A table in QuarkXPress 5 is essentially a group of boxes. Once you've created it, you can modify it by splitting or combining cells; changing text cells into picture cells and vice versa; inserting or deleting rows and columns; and specifying width, color, and style for the grid lines and border. A table can contain any combination of text and picture cells, and you can modify individual cells much as you would text and picture boxes.

If you need no-frills tools for creating basic tables, Quark's new table features are precisely what you need; if you're looking for heavy-duty tools, such as those in Microsoft Word, you're out of luck. For example, you can't import tables from Word

A Table of Pictures and Text			
Half-full Perspective		Half-empty Perspective	
Partly Sunny		Partly Cloudy	
Maybe Yes		Maybe No	

...but you can do a lot with basic tables: combining and splitting cells, adding rows and columns, changing picture boxes into text boxes and vice versa, and applying color and shading to the grid lines and border.

or Excel (unless you first save the table as text); you can't specify the color of individual grid lines; you can't automatically flow a long table from one page to another; you can't make a cell transparent; and you can't link text boxes within a table (this makes it particularly difficult to enter data),



though you can Control-Tab from cell to cell.

**Layers:** Most QuarkXPress users are already familiar with the concept of layers, either from using graphic programs such as Photoshop and Illustrator or from using third-party layer XTensions in previous versions of Quark. The Layers palette in Quark 5 lets you create and name as many layers as you want. You can then show or hide and lock or unlock individual layers. For example, you can create an annotation layer with special printing instructions, and the printer can hide the layer when it's time to output the document.

The Layers palette displays the names of all layers in a document and lets you change the stacking order of a layer by Option-dragging it. Control-clicking a layer name brings up a contextual menu with commands for deleting, modifying, and duplicating the selected layer, as well as showing or hiding and locking or unlocking all layers. One handy feature lets you maintain the runaround attributes of a layer even if it's hidden, so you can show and hide items on a page with the option to reflow text.

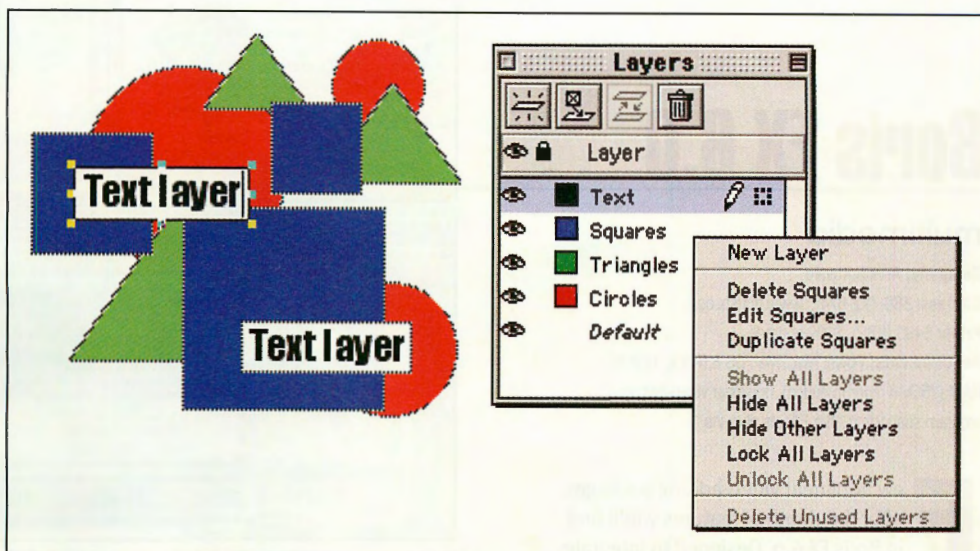
**Web publishing:** Version 5 greatly expands Quark's Web-publishing capabilities. Not only does it improve upon previously available features (export HTML text, import PDF files into picture boxes, and export documents as PDF files), it also has a full-blown tool set for creating design-intensive Web pages, and includes the avenue.quark XTension, previously sold as a separate product, for XML import and export.

Creating a Web document with Quark 5 is much like creating a print document; however, you must begin it as a Web doc (you can't convert print to HTML format).

If you need to convert a print document into a Web document, you can still do it the old cut-and-paste way.

Quark made several clever

**The Web Tools palette contains tools for creating image maps and form elements, such as check boxes, radio buttons, and pop-up menus.**



Quark's new Layers tools support all the layer standards: stacking, duplicating, hiding, locking, and so forth.

changes to the program's features and interface to accommodate Web-page creation. For example, typographic features such as horizontal scaling, tracking, kerning, and baseline shift, which HTML pages can't implement, are not available for text boxes in a Web document. For complex design elements, such as hand-styled text, stylized fonts, text on a Bézier path, and tables, you have the option to convert the elements into graphics (GIF, JPEG, or PNG) on export. If you convert a text box into a graphic, all typographic controls (horizontal scale, kern, track, and so on) are available for text within the box.

Quark 5 allows experienced users to create design-intensive Web pages that contain form elements with little additional training. On the other hand, Quark 5 is not a dedicated Web-page publishing program and consequently doesn't have the breadth of Web-specific features you'll find in programs such as Macromedia Dreamweaver and Adobe GoLive.

### Half Empty: What's Not in Quark 5

Like a Swiss Army knife, Quark 5 is a versatile, feature-laden tool. However, several features are conspicuously missing, in particular the ability to run natively under Mac OS X (though it's reasonably stable in the Classic environment).

Quark has explained that Apple's release of OS X developer resources occurred too far into the development of Quark 5 to allow creation of an OS X-compatible version. On the bright side, the company demonstrated an OS X-native version of Quark 5 in July 2001 and says it remains committed to OS X. Quark has not

announced a release date for this version, nor has the company said whether current users will have to pay for OS X compatibility.

Depending on your point of view, QuarkXPress is either aging gracefully or looking a bit long in the tooth. The program's overall look and feel hasn't changed much since the late 1980s, it doesn't offer any controls for managing the numerous palettes, and it remains a click-and-drag-intensive application. No doubt the status quo and Quark's ongoing continuity will reassure some longtime users, but others will likely leave Quark behind as they migrate to OS X.

—John Cruise

**good news:** Well-integrated table, layer, and Web features. Stable. Familiar interface. **bad news:** Not OS X native. Aging interface. Most new features previously available via third-party XTensions.



## Adios, Old Extensions

**C**aveat emptor: Quark changed the software development kit for QuarkXPress 5, and as a result third-party XTensions developed for use with Quark 4 may not work with version 5.

Two major developers of commercial XTensions—ALAP, creator of XPert Tools, ShadowCaster, and several other XTensions; and Extensis, creator of QX-Tools—have said that previous versions of their XTensions are not compatible with Quark 5, and both companies are currently developing updates.



# Boris FX 6.0

## multimedia

9

**Company:** Artel Software

**Contact:** 888-772-6747, [www.borisfx.com](http://www.borisfx.com)

**Price:** \$495 (SRP), \$199 upgrade

**Requirements:** Power Mac, Mac OS 8.6–9.x, 128MB RAM (256MB recommended), nonlinear video-editing program supporting After Effects plug-ins

**F**ew nonlinear video-editing packages offer the depth of features you'll find in Boris FX 6.0. Designed to integrate with your current nonlinear editing tool, Boris requires a host application, such as Adobe's After Effects (*Reviews*, this issue, p49) or Premiere, or Apple's Final Cut Pro.

Version 6.0 brings considerable improvements to Boris FX. At the heart of the overhauled interface is a more efficient timeline, allowing one-click application of video, stills, and other media effects (such as color and gradients). You can add 3D shapes and filters with the same ease. Boris veterans will be glad to know that you can still hierarchically nest layers in the timeline, collapsing and revealing individual layers as you need them.

Boris FX lets you work with an unlimited number of layers of media in three dimensions. You can also animate and mix apply modes, making it possible to produce a vast range of results with a selection of over 60 filters. The comprehensive filters give you control over color correction, noise reduction, distortion, and blurs as well as light, particle, and natural effects, and you

can combine filters for an even broader range of effects. Natural filters such as rain or stars are surprisingly realistic, while the color filters enable you to correct and adjust any aspect of brightness and contrast, color balance, gamma levels, and hue saturation. Other color filters provide tinting and multitone effects, as well as color shift.

Boris also provides keying filters for extracting part of an image from the rest of the scene. The chroma-key filter is designed to composite footage shot against blue, red or green screens, and Boris's implementation makes short work of separating the background from the subject, even if the filming conditions weren't perfect. The program offers a total of 13 filters, including some that remove pixels of a particular color and luminance and others that preserve colors. There's even a range of filters for refining the keying process.

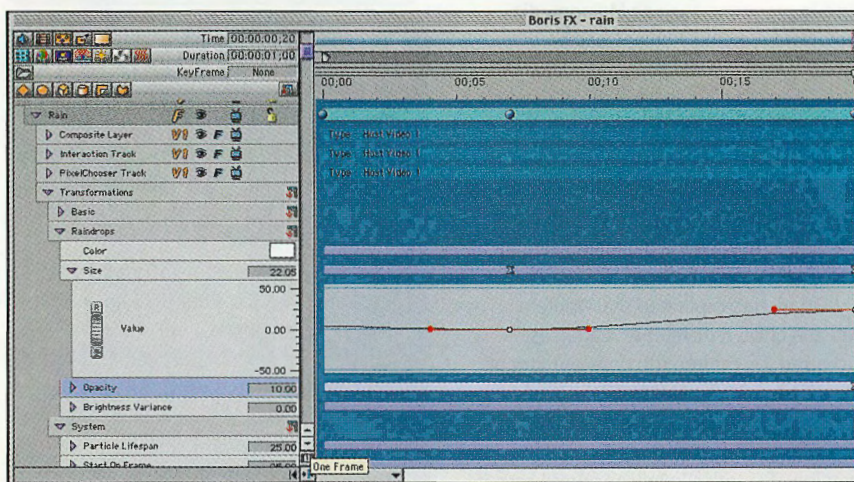
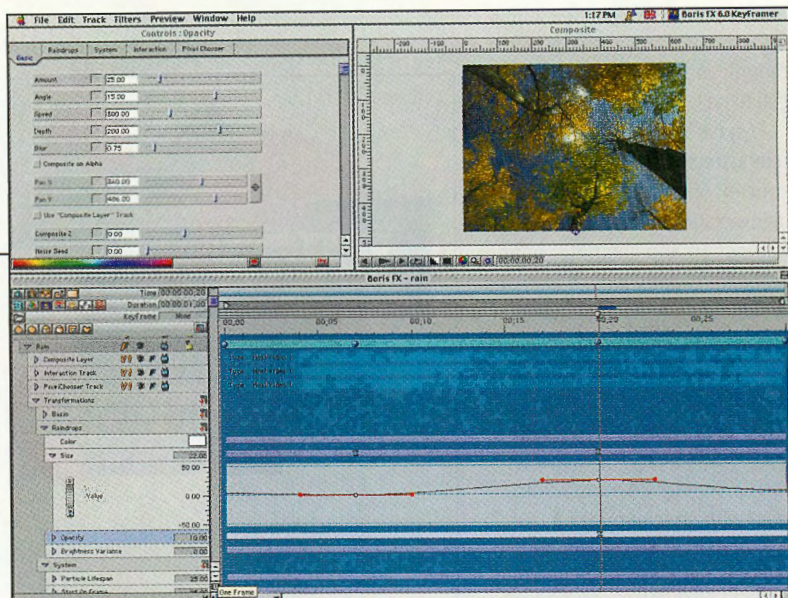
**It's definitely overkill for the iMovie crowd, but Boris FX and your high-end video editor can make beautiful music—er, movies—together.**

One of Boris FX's more unusual features is its ability to work with footage in 3D. You can create and animate basic 3D shapes, add footage and filter effects to them, and then animate them. With over 500 fully customizable transitions to choose from, it's possible to create just about any scene transition you can imagine. Boris provides a limited selection of audio-control tools, including level controls and a waveform display so you can synchronize audio tracks with effects and transitions. You can preview the effects in real time with the RAM preview option—the frames load into and play back from the RAM cache.

Boris FX 6 includes Keyframer, a sort of Mini-Me companion that provides the same user interface you see when using Boris FX from your host application. You can use this to create effects when your host application is busy with another task. Of course, without the host editor and Boris FX proper, you can't render any effects, but you can create and save effects, then render them when the host computer is free—good news for production companies trying to keep license costs down.

Boris FX 6 has been optimized for OpenGL and accelerated for AltiVec, and offers multiprocessor support. But as yet it's not Mac OS X native. Boris is overkill for simple editing jobs, but if you need pro-level DV effects, it's a strong set of tools well worth exploring.—Ed Haynes

**good news:** Integrates with your existing editing suite. High-quality keying, natural, and light filters. **bad news:** Requires a powerful Mac. Sometimes unstable. No OS X support.



**Boris FX's streamlined timeline keeps your layers and tracks organized.**



# Sacrifice

## fun & games

**Company:** MacPlay

**Contact:** 972-386-7575, [www.macplay.com](http://www.macplay.com)

**Price:** \$49.99 (SRP)

**Requirements:** G3 350MHz, Mac OS 9.2-9.x or 10.0.4 or later, 128MB RAM

**M**ultigenre games are the latest rage, and this is a good thing. Sacrifice marries real-time strategy with role-playing features, and throws in some hot action and spell-casting for good measure. The game is set in a surreal world where five gods—Persephone, James, Stratos, Pyro, and the deliciously evil Chamel—compete for control. You play a wizard whose skills each of them seeks for a number of missions. You get to choose whom to serve, but appeasing one god means opposing the others.

The missions take you to a variety of

**Gods, souls, and your own sacrificial altar—what more could you want in a game?**

stunning landscapes. Along the way, you must nourish your spell-casting powers by locating mana fountains and partaking of their magical energy. You also need to keep your deity happy by offering sacrificial souls at your altar. Unfortunately, the best way to get souls is to snatch up those of your enemies' followers, which exposes your own followers to the same risk. You can summon various creatures to help you: The three basic creature classes are melee, ranged, and flying.

Combat is fast and furious, and you're in the thick of it, collecting souls, coordinating attacks, and casting spells. Victory requires that you desecrate your opponent's altar—while keeping your own intact.



Overall, the challenges and story lines keep you engaged, and the characters are entertaining and well voiced. However, the game has some notable flaws—there's no multiplayer facility yet, and you can't customize your character. Plus, a strange bug disables Sacrifice's File Mapping on machines with more than 512MB of RAM running Mac OS 9. Despite this, Sacrifice is definitely worth a look.

—Robert Todd

**good news:** Superb graphics. Massive 3D battlefields. Strong story lines. **bad news:** No multiplayer feature yet. Not enough customization. Weird OS 9 memory bug.



# SmartScore 2.0

## audio

**Company:** Musitek

**Contact:** 800-676-8055 or 805-646-8051, [www.musitek.com](http://www.musitek.com)

**Price:** \$399 (SRP)

**Requirements:** Power Mac, Mac OS 8-9.x, 32MB RAM

**S**martScore is a splendid program for scanning sheet music and turning it into active documents, which you can then modify in any number of ways and ultimately play back as MIDI tracks.

This software will prove useful to music directors, educators, and students. The director can separate the score into individual parts and then modify it to meet the needs and instrumentation of a particular orchestra, or transpose it with ease. Students can isolate parts, break up staves into color-coded contrapuntal lines, or even create a music-minus-one score for practice purposes.

**SmartScore's split-screen format shows your working file and the original scan, so you can edit with ease.**

But first you have to scan in your score. The program imports directly from most TWAIN-compatible scanners, or you can import prescanned TIFFs. Obviously, big, neat scores work best; the manual warns against using small ones, but even a tiny pocket Stravinsky score worked well enough after we cleaned it up, which is the next step.

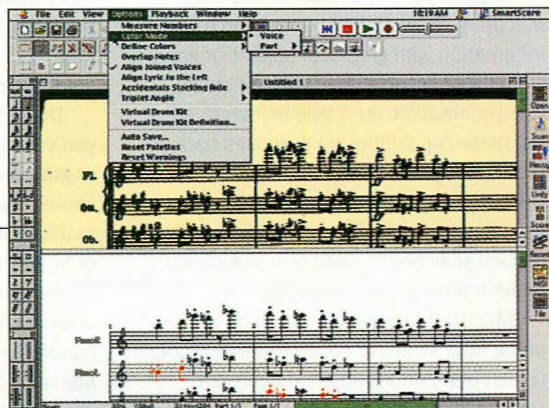
SmartScore reads music quite well, but because it does make mistakes, the program starts you off with a split screen showing the original scan on top and the SmartScore interpretation, or Extended Notation Format (ENF) file, beneath. From here you bring the ENF in line with the original via an easy and efficient interface. A clear, concise guidebook

walks you through a tutorial that will have you working with your own scores in no time.

Cleaning up the scanned score may take some time, and you still have to add some notation manually (ritardando and accelerando marks, for example), but once it's done, you're good to go. SmartScore is indispensable if you work with sheet music, requiring far less effort than managing a musical arrangement the old way.

—Kevin Caulfield

**good news:** Accurate score recognition. Improved MIDI support. **bad news:** Doesn't recognize some notation.



9



Find a demo of SmartScore 2.0 on the Disc.



# MacDraft 5.0.5

## design & graphics

**Company:** Macro Enter

**Contact:** 800-622-7568, [www.macroenter.com](http://www.macroenter.com)

**Price:** \$299 (SRP), upgrades \$99 and up

**Requirements:** Power Mac, Mac OS 8.1 or later, 8MB RAM (G4 Power Mac and 128MB RAM for OS X)

**M**acDraft was the first Mac CAD (computer-aided design) program, released for the Mac 512K back in 1984, but it's often overlooked because it has no big advertising budget and it's a very focused app. However, MacDraft has just the right mix of intuitive ease of use and raw power; its basic focus hasn't changed from the early days, but it has added many capabilities. Given its history, it's only fitting that MacDraft is one of the first CAD programs to run on Mac OS X. The program ships with two separate-but-comparable installations for Mac OS 8.1-9.x and for OS X.

Beyond serving as a basic CAD program, MacDraft can associate names and text information with graphical objects or groups. From these associations, you can create Excel-compatible reports with integrated database capabilities for purposes such as cost determination or manufacturer-data collection. If you've associated objects with names, you can perform global find-and-replace searches to swap one object with another throughout a drawing.

MacDraft can work in standard or metric units, from scales of 10:1 through 1:60,000 (1 inch per 5,000 feet) or 10:1 through 1:2,500, respectively. You can print to either a plotter or a standard inkjet or LaserWriter. For the latter, you can tile the image across a grid of sheets (up to 7 by 6) and paste the printed pages together to create the full drawing. (Macro Enter expects to have plotter drivers for OS X by the time you read this.) Like any CAD program, MacDraft offers full scaling. What's very cool is that when

you drag (or copy) one item created in a 1:5 scale and drop (or paste) it into a 1:10 scale drawing, the item changes to the correct size for the new drawing's scale. One limitation is that you must maintain a 1:1 ratio to change between metric and standard measurements.

Documents print according to how you've set up your workspace, with visible or grayed-out backgrounds and your choice of layer visibility. You can also use multiple layers as a slide show (manual or automatic) for project presentation.

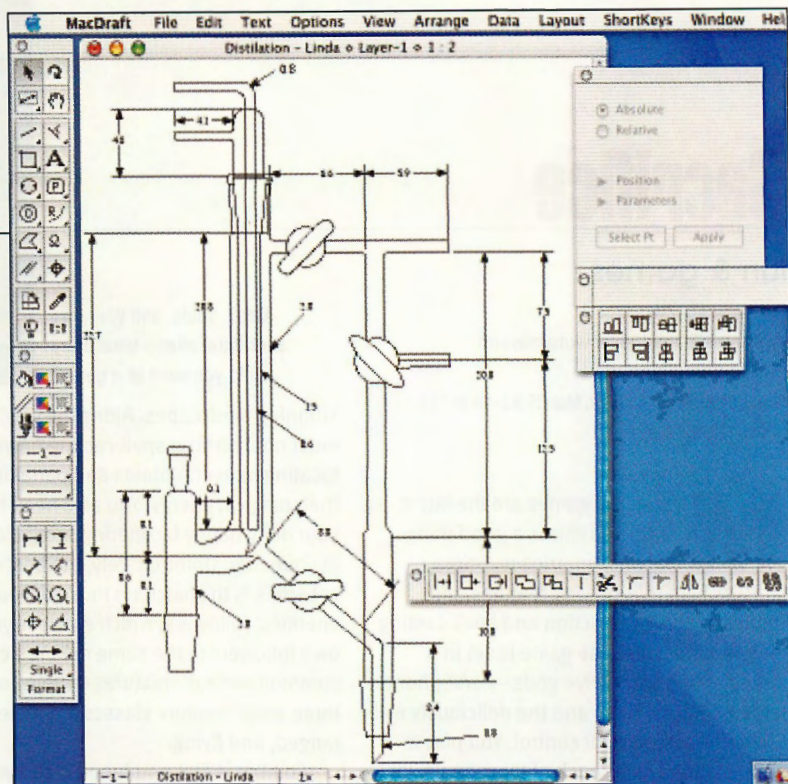
Although MacDraft is a CAD program and doesn't have many of the cool drawing features you'll find in Adobe Illustrator or Macromedia FreeHand, MacDraft can spoil you with the simple things. For example, when you use the new alignment palette, MacDraft asks to which object (and/or what part of that object) you want to align items. Thus, alignment doesn't cause *all* your selected objects to move on the page. In an even simpler example, round-corner rectangles have an extra handle for dragging the corner's radius to the desired size.

**The Accessory Palette** lets you easily combine, cut, or break apart graphic components and glue pieces together to create new objects.

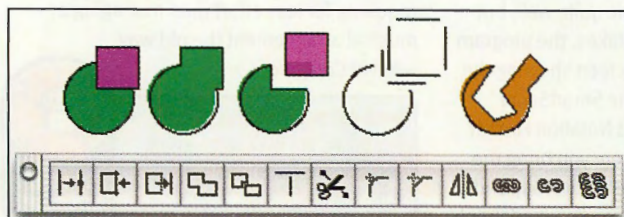
(Incidentally, these features have been around since version 1.) Similarly, unlike some CAD programs, MacDraft doesn't make you decide ahead of time what kind of line to draw and what attributes to assign it—you just grab the line tool and sweat the details later. You have similar control over object size: You can create objects in any scale and then resize them as you continue your drawing. If you're more interested in designing than drawing, you can pick up extra Symbol Libraries (\$129 for all five libraries, [www.macroenter.com](http://www.macroenter.com)), which contain everything from basic items (such as trees, cars, and kitchen sinks) to specific collections for architectural drawings and electronic schematics.

You can save files in PICT, Enhanced PICT, DXF (AutoCAD), DWG, and PC Draft as well as the native MacDraft format. You can also export into BMP, JPEG, MacPaint, Photoshop, PICT, PNG, QuickTime Image, SCI Image, TGA, and TIFF. Bottom line: MacDraft's simple yet powerful drawing tools won't wow you with the latest gee-whiz features—but unlike many fancy drawing and illustration programs, MacDraft lets you get stuff done quickly and efficiently.—Gary Coyne

**good news:** Easy-to-use CAD program with powerful features.  
**bad news:** Pricey upgrade if you already purchased version 5.



MacDraft was the Mac's first computer-aided design package, and it has aged very well.





# ArtMatic Pro 2.5

## multimedia

**Company:** U&I Software

**Contact:** 650-364-0556, [www.artmatic.com](http://www.artmatic.com)

**Price:** \$249 (SRP), \$199 (download version)

**Requirements:** Power Mac, System 7.5–Mac OS 9.x

**A**rtMatic Pro is one of those programs that will rob you of your weekend, or at least several hours of your hard-earned spare time. Under the guise of a static- and animated-texture generator, ArtMatic Pro is a worthy animation tool for anyone working with DV special effects. It can be as simple or as deep as you want it to be, and when we say *deep*, think Marianas Trench without the crushing pressure.

Simply put, ArtMatic is a visual synthesizer with real-time previews, which provide instant feedback on everything you do. From texture primitives (shapes, different flavors of noise, fractals, and more) to 3D objects, wild distortions, imported images, and QuickTime movies, you'll find a vast variety of luscious building blocks to string together in Trees (essentially visual flowcharts). The Tree menu offers a number of predefined Tree structures; you can also create your own custom definitions. Nesting Trees inside one another quickly leads to wonderfully rich and dense textures.

As you click each component of a Tree, you'll see a pop-up menu of the available operators. Each operator has up to three slider controls, which allow you to vary the look of the component. For example, a wave component has sliders for frequency, amplitude, and scale, while a fractal



**ArtMatic Pro takes eye candy to a whole new level: this luminously molten lava churns in time to an audio CD.**

component might have complexity and iterations sliders. As you change a slider's values, the texture in the main view updates in a subsampled mode, which is more than sufficient for seeing what you are doing to the overall texture. If you like what you see, you can grab the current state of the screen as a keyframe and use it to create interpolated animations. A Random Interpolation mode allows you to create instant (and generally bizarre) animations. While there is no timeline view of your captured keyframes, you don't need to worry about smoothing edges, because Artmatic automatically tiles the image and loops the animation—both without visible seams. Building video walls and MTV-style music-video elements was never so easy.

ArtMatic offers extensive controls for changing colors, mapping color gradients, and even introducing pseudo-3D elements such as fog, haze, and lighting effects into your animations. As if this wasn't enough flexibility, additional modes allow creation of tiling and symmetry effects, as well as music and sound-driven animations. Pop an audio CD into your CD-ROM, and ArtMatic will create real-time animation that responds to the sound's volume and timbre changes. Look, Ma, it's a screensaver!

You can get started by simply browsing through and modifying the 3,000 presets supplied on the CD-ROM version, which is a great introduction to the program's depth and complexity. There are enough presets on the download version to get you into the heart of ArtMatic, and the extensive PDF documentation delivers a good foundation on the overwhelming variety of operators and options. If you don't want to wrap your

	Ax+By+C		Random Cones
	Line		Star Field
	Gaussian Dot		Facet
	Lozenge		Bubbles
	Multiply (x+A)*(y+B)		Techno
	Distance		Pyramids
	Distance*(x+y)		Random Squares
	Radial		Random noise
	Min <-> Max		Fractal noise
	Min+Max		Multi Fractal noise
	Difference		Low freq noise
	Grid		Crystal noise
	Hexa grid		Perlin noise
	Hexagons		Bump noise
	Sin x + Sin y		Zebra noise
	Sin x * Sin y		Fractal Lines
	x + A Sin y		Smooth Entrelas
	Hexa sines		Circuitry
	Circles		ZigZag
	Ripples		PicUMovie
	Dynamo		PicUMovie SymTile
	Craters		Blurred PicUMovie

**This is a sampling of just one of the component category's pop-up menus.**

brain around all this stuff, fret not: You can simply click on the dice icons in the main view to change the current Tree structure operators at random, yielding new textures instantly. A detailed Mutations dialog box gives you more control over the process and is an excellent way to create variations on a specific look.

ArtMatic Pro doesn't yet come in an OS X-version, but it runs just fine in the Classic environment. Don't let this keep you from taking a close look at this software, though: ArtMatic Pro is a great way to go blind and crazy all at once, while making some of the coolest pictures and movies you've ever seen on a Mac screen.—David Biedny

**good news:** Organic textures without programming. Deep enough for serious artists.

**bad news:** No Carbon. No timeline for keyframes.



**The Mutations dialog box allows you to randomize functions, colors, or both for quick variations on a theme.**

9



Find a demo of ArtMatic on the Disc.



# Kyocera Finecam S3

## hardware

9

**Company:** Kyocera Optics

**Contact:** 732-560-0060 or 800-526-0266,

www.yashica.com

**Price:** \$499 (SRP)

**Requirements:** Power Mac with built-in USB port, Mac OS 8.5-9.x, 64MB RAM, 120MB free hard disk space, CD-ROM



PHOTOGRAPH BY MARK MADEO

**This 3.3-megapixel midget is one fine cam.**

**T**he size of a credit card and only an inch thick, the 3.3-megapixel Kyocera Finecam S3's classic stainless-steel body guarantees envious looks and "ooh-aah" refrains. But is the Finecam really a fine cam?

We liked the Finecam's excellent arrangement of controls and easy-to-navigate menus. And despite its diminutive size, the buttons and dials don't require Lilliputian hands and fingers. When we turned the camera on, the 7.8mm-to-15.6mm zoom lens (equivalent to 38mm to 76mm on a 35mm camera) emerged smoothly



**We see a bad moon rising...in that good way. We took this night shot with a 2-second exposure at f-2.8 on a tripod.**



**The Finecam produces accurate colors and good detail in the shadows and highlights.**

from behind its built-in lens cover. A three-position mode switch allows for simple setup and then gives you a choice of shoot or show. A four-way rocker whisks you through menus, and strategically located buttons control zoom, flash, and macro functions.

The Display button can switch off the 1.5-inch LCD monitor to conserve battery power—you'll need this feature. To keep the Finecam svelte, Kyocera's engineers designed a slim, rectangular Lilon battery. At 3.6 volts and only 800 mAh (milli ampere hours), it doesn't last long. However, if you limit flash and cut down on display use by framing your images through the optical viewfinder, you can take about 100 pictures before it's time for a 5-hour in-camera recharge. We recommend you buy an extra \$45 battery or two.

The Finecam uses either a tiny MultiMedia Card (MMC) or Secure Digital (SD) memory card. Although we were annoyed to have yet another storage standard to maintain, Kyocera (to its credit) supplies a 16MB card and a USB memory-card reader, which works out of the box with Mac OS 9.x, provided you disable USB Mass Storage Support (an Apple system extension). This is a good thing since, without it, there's no direct way to transfer images from the camera to your Mac. The included CD-ROM doesn't provide OS 8.5 and 8.6 drivers, but you can download them at Microtech International's site (<http://microtechint.com>). The camera comes bundled with Arcsoft's Photolmpression software for image editing.

The Finecam isn't a speed demon, but it's no slug either. Shot-to-shot time in Record is a longish 3 to 5 seconds, but in Playback it's instantaneous; you'll find it a real joy to fly through your images. Put the

camera on a tripod and take advantage of its selection of 2-, 4-, and 8-second shutter speeds for creative night photos. Or use the built-in flash at parties—it has a good reach and gives excellent edge-to-edge scene coverage.

The camera's image quality was an enigma. Sometimes the exposures were right on and the pictures looked terrific, while other times they were too light or too dark, requiring a retake after fiddling with the exposure-compensation feature. Color rendition was very good, white balance performed well, and digital artifacts were not generally noticeable. Even so, the Finecam's images were not as sharp as those of most 3-megapixel cameras, and sometimes we needed to tweak them in Photoshop Elements to produce crisp photos in larger sizes.

Some nifty features that elevate the Finecam above mere point-and-shoot digicams are three light-metering modes, limited aperture priority (f-2.8 or f-6.2), shutter speeds from 8 seconds to 1/2,000 second, a silent-movie mode, Print Image Matching (PIM) for extended-range color photos on PIM-enabled Epson printers, black-and-white and sepia modes, and manual focus. It also has a slide-show feature.

The Finecam S3 is the smallest 3-megapixel camera in the world. If you want to record your life and times without dragging around a brick, make this digicam your constant companion.—Arthur Bleich

**good news:** Tiny. Easy to use. Logical control layout. Memory-card reader included. **bad news:** Short battery life. Erratic image quality. No direct image-transfer from camera to computer. No Mac OS X support.



**spiffy**



# ABS Plus

## hardware

**Company:** CMS Peripherals  
**Contact:** 714-424-5520, [www.cmsproducts.com](http://www.cmsproducts.com)  
**Price:** \$237 to \$509 (SRP) for 10 to 40GB drives  
**Requirements:** FireWire-enabled Power Mac, Mac OS 8.6 or later

If you reside in the land of the lazy, here's the appliance for you. The ABS Plus FireWire drive automatically backs up your Mac OS 9 or Mac OS X system in a matter of minutes.

Backing up your machine has never been easier: Install the software, plug in the bus-powered drive, watch the green startup lights make a cute flower pattern, and choose Express or Advanced settings depending on what you want to back up. Our initial backups in Mac OS 9 and Mac OS X took about 20 minutes each on a 400MHz G4 with a 9/10-full 10GB drive. Subsequent

**If the ABS Plus can't make you back up your Mac, you might want to check your pulse.**

backups took only a few minutes (we tested the 30GB model). You retrieve your files by dragging them off the ABS Plus, which mounts like a regular hard drive volume on your desktop; you can set it to back up your system automatically or on demand.

We ran into some quirks when using the ABS Plus with Mac OS X. We had to turn the drive on and off for our Mac to recognize the FireWire volume. We could drag and drop onto the drive volume fine, but we couldn't boot from the drive. CMS says this problem is due to restricted access to root-level OS X files, and plans to have a fix by the time you read this.



PHOTOGRAPH BY MARK MADEO

X  
9

The ABS backup system is basic. You could do this yourself for much less money by purchasing a low-profile FireWire drive (we found a 30GB one for \$250 at [www.otherworldcomputing.com](http://www.otherworldcomputing.com)) and Retrospect Express Backup (\$49 SRP; not fully Mac OS X operational as of press time).

But if an extra \$100 worth of convenience will prompt you to back up your files regularly, it's worth the money.

—Narasu Rebbapragada

**good news:** No brains required. Slim, lightweight drive.  
**bad news:** Pricey. Mac OS X quirks.



# Mbox

## hardware

**Company:** Digidesign  
**Contact:** 800-333-2137, [www.digidesign.com](http://www.digidesign.com)  
**Price:** \$495 (SRP)  
**Requirements:** Power Mac with built-in USB, Mac OS 9.1–9.x, 128MB RAM (192MB recommended)

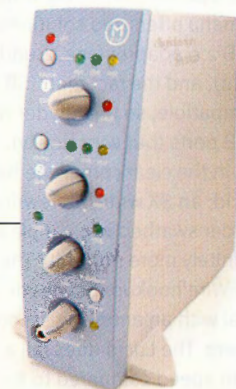
A \$10,000 Pro Tools hardware system may be the ultimate dream for hard-core recording engineers, but Digidesign's Mbox USB audio interface is destined to be the modern-day four-track recorder for every musician. With its analog and digital I/O, bus-powered portability, and inclusion of the mighty Pro Tools LE, Mbox allows you to set up a mini-recording studio literally anywhere you can take your Mac.

The 6 1/4-inch-tall device features two XLR-and-1/4-inch combo analog inputs, two 1/4-inch analog outputs, S/PDIF digital I/O via RCA jacks, two insert points (one per

input), and a 1/4-inch headphone jack in its rear. The face features gain controls for the two inputs, source selectors, an input-playback mix control, and a 1/8-inch headphone jack and volume knob. Through its assorted ports, the Mbox supports sample rates up to 48kHz.

Though Digidesign touts Mbox's zero latency recording, this spec applies to input monitoring only. The playback has a slight lag; it won't goof your timing during overdubs, but it can be a bit disconcerting when you hear it.

We love Pro Tools, but our poor 500MHz iBook (with 256MB of RAM) choked when we tried to process three audio tracks with a few effects (that's the nature of audio recording—you need a helluva lotta RAM). However, our 400MHz G4 (with 448MB of RAM) had no problem recording and playing back eight audio tracks with a few effects on each channel.



PHOTOGRAPH BY MARK MADEO

9

**We tethered the Mbox to an iBook and recorded guitar tracks at the beach—now that's portability.**

For the musician on the go who doesn't want to shell out the extra dough for a professional hardware audio interface, but who needs pro jacks to connect gear and an awesome recording app, the Mbox packs a punch in a portable (though pricey) package. —Kris Fong

**good news:** Powered by USB bus. XLR inputs. Includes Pro Tools LE  
**bad news:** Sucks processors like candy. Slight latency on playback. Pricey.





## CD-RW Head to Head

### hardware



#### Lucid

**Company:** MCE Technologies

**Contact:** 949-458-0800, [www.mctech.com](http://www.mctech.com)

**Price:** \$299 (SRP)

**Requirements:** FireWire-equipped Mac, Mac OS 8.6–9.x or 10.1 or later



#### CRW-70 Spyder

**Company:** Yamaha

**Contact:** 714-522-9011, [www.yamaha.com](http://www.yamaha.com)

**Price:** \$299.99 (SRP)

**Requirements:** 300MHz G3 or faster, Mac OS 9.0.4 or later

**T**his CD-RW showdown could also be called a battle of the buses: The Lucid uses FireWire, while Yamaha claims the Spyder is the first USB 2.0 CD-RW drive. At press time, Apple is still on the fence about supporting USB 2.0, but Yamaha offers two solutions: the included USB 2.0 adapter (see “Bundle Bungles,” right), and the fact that USB 2.0 is backward compatible, so the Spyder works with older USB ports (but *very* slowly).

In the clear corner, we have MCE's Lucid: an 8X write/8X rewrite/24X read tray loader swathed in clear plastic. The Lucid is infinitely more portable: The bus-powered FireWire hookup means you don't have to deal with an annoying second cord for power. The Lucid does fall a bit short in burn speed compared to the 12X/8X/24X Spyder, but the Lucid wins on a technicality: At press time, the only Mac-friendly USB 2.0 adapter (Orange Micro's OrangeUSB) works in Mac OS X, but none of the Spyder's bundled software does. The Spyder is backward compatible with the Mac's onboard USB (version 1.1) in both Mac OS versions, but only at 4X/4X/8X speeds.

**The Spyder's AC entourage nearly matches the size and weight of the drive itself, making the entire rig only half as portable as the drive alone.**



**Combined, these two CD-RW drivers do it all: Either one might be just what you need.**

In the Graphite corner, Yamaha's Spyder is a scant .5-inch longer (front to back). Otherwise, the two drives consume the same amount of desk space, with one notable exception: Opening the Spyder's flip-top disc door requires approximately 5 inches of vertical clearance above the drive; opening the Lucid's disc tray nearly doubles the drive's footprint. Tray loaders may look cooler than flip tops, but in this case, the Spyder feels much more rugged than the Lucid when you snap in a disc.

Where the iTunes-supported Lucid excels in portability and Mac compatibility, the independent and iTunes-ignorant Spyder wins the *Miss Convergent Home Appliance* award. The Spyder's trump card is its ability to play MP3 CDs through your stereo, if you don't mind the limited playback-control options (Repeat One, Repeat All, Shuffle, or click through track numbers with the drive's forward button). When it's attached to your Mac, you'll appreciate the Spyder's industry-leading 8MB buffer cache; it will help you avoid wasting discs when the Mac can't feed data as fast as the drive wants it—a common scenario with the slow USB 1.1 bus.

In terms of raw performance, both drives lived up to their claimed specs. The Lucid burned our 480MB test CD in 10 minutes flat; the Spyder burned the same file in about 20 minutes via our Mac's onboard USB, but when we upgraded to USB 2.0, the Spyder burned that 480MB in a cool 7 minutes.

So which device is better? If you intend to exercise your *portability* options, FireWire makes the Lucid the clear choice (yes, pun

intended): Grab the drive, one cable, and you're good to go. If you're more interested in a drive that works with or without your Mac, the MP3-playing stand-alone Spyder will do your home-entertainment center proud.—*Niko Coucouvanis*

#### Lucid

**good news:** Stealthily portable.

FireWire fast. Plays well with iTunes.

**bad news:** Tray feels flimsy. Brutishly stiff FireWire cable.



#### CRW-70 Spyder

**good news:** Solid design. Works with Mac or home stereo. Free USB 2.0 adapter. **bad news:** Ungainly power supply. Top performance requires upgrades.



## Bundle Bungles

**Lucid** MCE provides a bundled copy of Toast Lite, which rocks—until you consider the lack of an OS X version. One solution is to upgrade to Toast 5 Titanium (for OS X or 9.x). Plan B (rhymes with free!) is to install the Authoring Support files (included in the package), which provide full support for Apple's iTunes and Disc Bumper in both OS 9.x and OS X.

**Spyder** Yamaha includes a coupon for an OrangeMicro OrangeUSB USB 2.0 PCI card (free except for \$6.95 shipping) or for a CardBus PC card (\$26.95 with shipping). A perfect solution? Not quite—as of press time, OrangeMicro's USB 2.0 adapters only work under Mac OS X, where none of the Spyder's bundled software works. Nor does the Spyder support iTunes or Disc Bumper in OS 9 or OS X (though we burned data CDs from the OS X Finder via Disc Bumper). The workaround: You'll have to pony up \$99.95 to get Toast 5 Titanium for OS X.



# Sid Meier's Civilization III

## fun & games

**Company:** MacSoft

**Contact:** 800-229-2714, [www.wizworks.com/macsoft](http://www.wizworks.com/macsoft)

**Price:** \$49.99 (SRP)

**Requirements:** 300MHz G3 or faster, Mac OS 8.6–9.x or 10.0.4 or later. 64MB RAM for Mac OS 8.6 or 128MB RAM for OS X



**Continuing its almost decade-long tradition of turn-based strategy-game superiority, Civilization III looks great in Mac OS X.**

**S**id Meier has been entertaining strategy-game lovers with the Civilization franchise for nearly a decade. MacSoft's Civilization III brings this time-tested game to Mac OS X and to a new generation of strategy addicts.

Civilization III tasks you with creating a dominant civilization from a tribe of wandering nomads starting in 4000 B.C. You must found cities, research advances ranging from primitive ceremonial burials to modern-day synthetic fibers, and develop cities and military that can survive into modern times.

Sid Meier's company, Firaxis, made many changes from Civilization II, beefing up weak parts while avoiding unnecessary complexity. For starters, each civilization has two defining (and loosely historical) traits that translate to advantages in the game, as well as a unique military unit. For the first time, it actually makes a difference whether you play as the Romans or the Zulus.

Additionally, your civilization's cultural development has a significant effect on gameplay: Culturally superior civilizations can induce the cities of inferior neighbors to switch sides spontaneously. Culture also defines your country's borders and affects the way rivals treat you in diplomacy.



**Mr. Gandhi, how 'bout if I give you some uranium and you give me some cash? Just, uh, promise not to nuke anybody with it, okay?**

Of course, even the most awesome civilization is a lost cause without a strong military to protect it. In Civ III, however, you can't build advanced military units or make terrain improvements unless you have access to strategic resources. You can acquire these resources by trading—or by bullying your opponents.

New conditions for victory round out the experience. Earlier versions let you win by either eliminating all your rivals or landing a spaceship on Alpha Centauri. Now you can win by domination (controlling *most* of the world), diplomacy (being elected Secretary-General of the United Nations), or creating a culture so freakin' awesome that the rest of the world envies it and joins your side.

Civilization is still the Mac's leading turn-based strategy game, but despite its many strengths, we must reluctantly give Civ III a mere *Spiffy* rating. We love this game, but it feels unfinished, with rough edges that shouldn't plague a proud ten-year-old franchise (see "Unfinished Business," below). Even so, you should buy two copies *right now*—and keep one in a fireproof safe so you can keep playing it on your iBook if your house burns down. It's that addictive.—*Jason Whong*

**good news:** Years of replay value.  
Runs natively in OS X.

**bad news:** Years of replay value.  
Rough edges abound.



## Unfinished Business

- Civilization III's interface is surprisingly unfriendly. It relies unnecessarily on control-clicks in places where normal clicks have no function. You use buttons, instead of menus, to issue orders to your troops, but they don't dim when those orders are temporarily unavailable. Confusing.
- Keyboard shortcuts sometimes use the Control, Command, and Shift keys, or various combinations thereof. Is this degree of complexity really necessary?
- In-game preferences apply only to your saved game. When you start a new game, you have to reset the prefs. On the plus side, your Mac-specific prefs save properly.
- You can now use a leader to build an army—a fresh, powerful unit—but neither the manual nor the online help explains, step by step, how to do this.
- A type of combat new to Civ III, bombardment, makes this the first Civilization in which a bomber can never crash when attacking guys with pointy sticks, since bombardment is a one-way transaction—"one way" meaning that when you bomb poorly armed groups, their only possible response is to duck and cover. Bombardment can weaken, but not destroy, units, making this the first Civilization in which bombers alone can't defeat a navy—which is fine if you're the navy, but not so fine if you're the bomber.



## OmniPage Pro X

### productivity

**Company:** Scansoft

**Contact:** 978-977-2000, [www.scansoft.com](http://www.scansoft.com)

**Price:** \$499 (SRP), \$149.99 (upgrade from any OCR program)

**Requirements:** G3 or later, Mac OS 9.x or 10.1 or later, 64MB RAM (128MB for OS X), scanner

OmniPage can do a whole lot more than just recognize characters: The Proofreader feature also detects misspelled words.

It's been three years since Scansoft last updated OmniPage, but OmniPage Pro X, the latest generation in OCR (optical character recognition) software, was worth the wait. OCR is the process of turning a graphical scan into editable text.

OmniPage's OCR accuracy is better than ever—it's not perfect, but it's usually very good, even on pages with complex

formatting. The program highlights words it's unsure of, and the proofreading function makes it easy to locate and correct errors. In addition to offering a built-in dictionary, OmniPage supports user-created dictionaries—you can even import custom dictionaries from Microsoft Word. OmniPage also has improved table manners compared with the previous version's; the program

handily recognized our table-bound data.

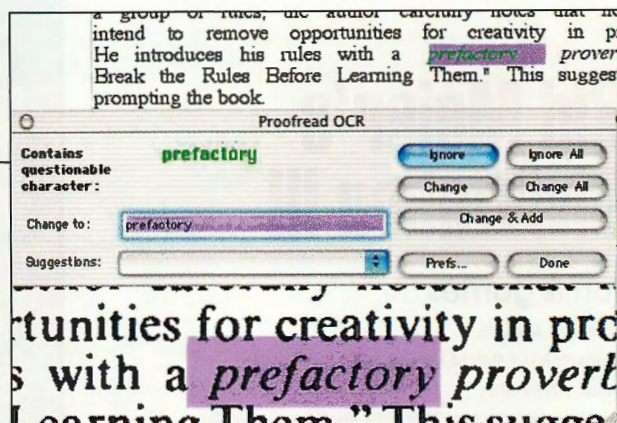
Once it has scanned, recognized, and proofread your pages, OmniPage Pro X can export the text in a variety of formats—with varying degrees of success. Microsoft Word files look good, retaining the layout of the original page. But HTML and RTF output often leaves much to be desired: Misplaced graphics and too-small text plagued our test pages.

The application can also export documents as Portable Document Format (PDF) files. You can choose from several flavors of PDF, including Images Only; Image On Text, which retains the exact look of the original document but has searchable text; and Normal, which reproduces the look of the original page using text instead of graphics, creating a much smaller file. Unfortunately the text is often irregular, with distracting changes in fonts and baseline height.

OmniPage is compatible with automatic document feeders for scanning multiple-page documents. But OmniPage doesn't include scanner drivers, so you'll need to install it over a working scanner setup, with a TWAIN driver or a Photoshop-scanner plug-in. OmniPage can also suck text directly out of PDF files (even read-only ones), so you technically don't even need a scanner.

Given the sad state of the OS X-compatible scanner market, OmniPage's OS X support is more a badge of honor than a functional benefit, but with the right scanner—or with good old Mac OS 9—OmniPage is a capable OCR program, especially if you don't need fancily formatted output. —Kevin Savetz

**good news:** Accurate OCR with good correction tools. PDF support. Good support for tables. **bad news:** Output quality is poor for some file types, especially on complex pages.

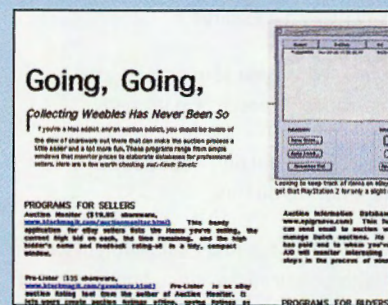


## The Proof's in the Outputting

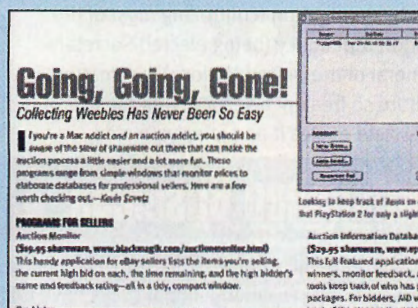
OCR is only half the battle: The other half lies in what happens when you export the pages. OmniPage Pro X renders pages very differently depending on what file format you use.



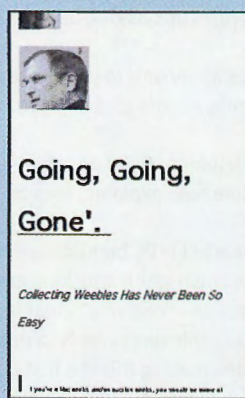
Here's the scan OmniPage started with.



The document looks good but isn't quite perfect when exported as a Microsoft Word file.



When saved as a PDF file with images, the document looks remarkably like the original, but the text is slightly skewed.



When saved as a Web page, documents with complex layouts turn to mush, with misplaced graphics and tiny, unreadable body text.



# Otto Matic

## fun & games

**Company:** Aspyr

**Contact:** 888-212-7797 or 512-708-8100,

www.aspyr.com

**Price:** \$34.95 (SRP)

**Requirements:** 266MHz G3, iMac DV, or later model; Mac OS 8.6–9.x or Mac OS 10.1 or later; 96MB RAM; Rage 128, nVidia GeForce 2, or later 3D accelerator

**G**ames that inspire terms like *good clean fun* and *cute* usually get old fast. However, Otto Matic's easy-but-not-too-easy gameplay, fun cartoon graphics, and general wackiness make it yet another Pangea game that's so cute we're almost embarrassed to play it, but so fun we can't stop. If you've bought a Mac in the last few years, you know what we're talking about—like Pangea's past cute hits (Nanosaur, Bugdom, and Cro-Mag Rally), Otto Matic comes preloaded on the latest consumer Macs.

What do we mean by cute? The first level, Planet Earth: The Bentley Farm, sets the tone with an overdose of pure 1950s Americana—the red barn and silo, the beehive hairdo, the flying-saucer UFO, and of course you, the noble Otto Matic, humanity's last hope—all in bold, bright, cartoony graphics. Add a soundtrack of madcap, melodramatic music (à la *Twilight Zone* and old sci-fi movies), and we're hooked. And that's just the game's opening scene. Later in level one, we encounter friendly veggies gone bad (supersize corn, onions, and tomatoes that have gone psycho after the aliens irradiated them), and a possessed tractor with a taste for robot—all formidable foes, but easy enough



Sometimes you can't see the forest for the trees—or Otto for the shrubbery.



Otto Matic takes place in 1957, when saucer-shaped UFOs and beehive hairdos were all the rage.

to beat with the generous supply of weapons you can pick up along the way. The next nine levels take you to faraway planets with strange and wondrous beings—all of whom want a piece of Otto.

In concept and gameplay, Otto Matic is as easy as it gets—you scurry through alien worlds collecting wayward humans and battling evil aliens and their minions, often while performing difficult feats of robo-dexterity (such as water-skiing, cloud-hopping, and negotiating a dizzying—and not terribly fun—procession of spinning gears and platforms in the fourth level). Controlling Otto requires only the arrow keys for basic movement; you use Option, Command, and the spacebar to punch or to pick up a power-up, to fire a weapon, and to jump, respectively. Yes, that's punch or pick up with the same key; ordinarily, we'd change the game's controls and assign punch and pick up to different keys, which we did in Mac OS 9. However you can't do that in Mac OS X (where InputSprocket drivers don't work). As a result, on occasion we inadvertently collected power-ups when we meant to smack down an alien.



This ferocious fauna won't eat you, but it will snatch you up and spit you out.

Of course, many of the power-ups are weapons—the basic ray gun, freeze ray, flamethrower, darts, and flare gun—which are generally more effective than punching (unless you try the flamethrower on the Flame Creatures of level 8—duh!).

Another control we used a lot during the game is the camera-view adjustment. Otto Matic employs the same over-the-shoulder view as other Pangea games, and like Rollie (the star of Bugdom), Otto often disappears from your view when he gets too close to environmental obstacles like trees and walls. The angle-bracket keys (< and >) rotate the camera view, and the Tab key swings it all the way back to the default position behind Otto.

Apart from its unconfigurable player controls, Otto Matic 1.0.2 runs well in Mac OS 8.6 to 9.x and in Mac OS X. The key word here is 1.0.2. Without this upgrade (free at [www.pangeasoft.net](http://www.pangeasoft.net)), the game's beautiful graphics give way to a mass of flickering triangles in every level after the first one if you're playing under OS X with a PCI Rage 128 video card. The update fixes other minor bugs, so get it regardless of what video card or OS version you have.

Hard-core gamers and Unreal Tournament fiends might scoff, but Otto Matic offers just the right mix of nongory violence, killer graphics, and both repetitive and nonrepetitive gameplay. We wholeheartedly recommend it for almost anyone.

—Niko Coucouvanis

**good news:** Good clean fun. Big, pretty graphics. Cute but not sickeningly so. **bad news:** Some levels suck. No midlevel saves.





# powerplay

We're game, are you?

## X Games

### Classic or Carbon—New Games For You

**S**ome may question MacPlay's decision, announced at Mac Expo 2002, to publish future games for Mac OS X only. Is the company cutting off a large pool of customers who aren't yet ready to upgrade their systems? Only time will tell, but it's indisputable that MacPlay is providing gamers with some of the biggest titles to hit the Mac, and those publishers who've decided to stick with developing Classic games have plenty in store, too.—*Carrie Shepherd*

#### MacPlay

[www.macplay.com](http://www.macplay.com)

Recent additions to MacPlay's lineup include *Icewind Dale* and *realMyst* for Classic and Carbon OSs. The latter is the latest iteration of the game that just won't die—*Myst*, a classic for nearly a decade. Both games should be available by the time you read this.

*Icewind Dale* is an old-school fantasy dungeon crawl in the vein of *Baldur's Gate* (you know: magic spells, fantastic monsters, and increasingly difficult obstacles). Players form a party of adventurers to battle frost giants and cyclops as they search for the evil embedded in the Spine of the World (shiver).

*RealMyst* brings 1993's *Myst* up to current graphics standards, adding a real-time 3D engine, environmental changes such as weather and day-to-night cycles, and 360-degree movement. Our crystal ball sees an anniversary edition in the works as well, but there's no confirmation on that prediction.

**Adventurers in *Icewind Dale* sometimes get a cool reception.**

#### MacSoft

[www.wizworks.com/macsoft](http://www.wizworks.com/macsoft)

Along with *Max Payne*, coming in May (see *Powerplay*, Apr/02, p60), MacSoft recently hit the decks with *Beach Head 2002* and *Stronghold*. Almost a year in the works, *Master of Orion III* (see *Powerplay*, Aug/01, p59, for more information) is now set for release in June 2002.

*Stronghold*, a castle-building real-time strategy game, puts you in charge of a medieval society, where you design, manage, and defend your fortress against four enemy lords and their subjects. Besides building your castle, you can focus on either combat or managing your economy. As is true of the best sim games, the fun is in the details. *Stronghold* lets you give out free beer or impale enemies' heads on



**Stronghold makes burning down the house look downright beautiful.**

sticks. Just beware those popularity ratings.

*Beach Head 2002*, like its predecessor *Beach Head 2000*, is a first-person WWII shooter where you, a soldier, defend an inland command post. You'll suffer onslaughts from paratroopers and special ops forces, with attacks from 360 degrees. You'll face formidable obstacles like tank traps and oil-filled moats. New equipment includes night-vision goggles, an M60 machine gun, and a mortar with cluster-bombs.

#### Aspyr Media

[www.aspyr.com](http://www.aspyr.com)

Aspyr's second LucasArts title for the Mac, *Star Wars: Galactic Battlegrounds*, is slated to hit stores in early May 2002. This one's a real-time strategy title with Wookiees, Gungans, the Rebel Alliance, and other Star Wars civilizations. Battles take place all over the universe: faraway asteroids and submerged cities—over land, in the sea, and in space. A scenario editor for both single-player and multiplayer battles makes this game particularly worthy of your gaming dollars.

#### Legacy Interactive

[www.legacyinteractive.com](http://www.legacyinteractive.com)

Test your medical rescue skills with *911 Paramedic*, Legacy Interactive's latest medical sim, following in the footsteps of the company's long line of Emergency Room games. In 35 emergency scenarios, you diagnose and treat patients, working against the clock. (If you're studying a medical profession, this could be good practice.) Legacy is donating a significant portion of the proceeds from each sale to the National Association of Emergency Medical Technicians EMS and Rescuer Relief Fund, established in the wake of the September 11 terrorist attacks.



**Stomach-churning bloody victims are all part of a day's work in *911 Paramedic*.**





Buying a new Power Mac G4 is the only way to get the Radeon 7500.

## Power Graphics for Power Macs

### Three New Graphics Cards for Gorgeous Gaming

Mac gaming is now one step closer to the kick-ass 3D realism we see in Xbox game graphics. The new Power Mac lineup—including the Dual GHz G4 (see *Reviews*, this issue, p48)—offers three new graphics cards for better-looking and better-performing games, and each supports dual displays (see “Stacking the Cards,” below, for more information).

ATI's Radeon 7500 comes standard with the lower-end 800MHz G4 and built-to-order with the higher-end G4s. Originally PC only, the 7500 is an updated version of the Radeon, with support for bump mapping (for bumpier textures without additional polygons) and two rendering pipelines, each of which can handle three textures per pass. With faster clock speed and a faster memory interface, the 7500 almost doubles the performance of the original Radeon, says ATI.

According to nVidia, its lower-end GeForce4 MX outperforms the GeForce2 MX and even the GeForce3 in some areas (for benchmark comparisons, see “Accelerate Your Mac” at [www.xlr8yourmac.com](http://www.xlr8yourmac.com)). The performance gains come from better communication between the chip and the onboard RAM, a new visibility subsystem that renders only visible pixels (as opposed to the the pixels in objects hidden from view), and full-scene antialiasing (this smooths out the jaggies) with a reduced performance hit. The GeForce4 MX lacks the nfiniteFX engine, which on the higher-end GeForce3 and GeForce4

## SCREENSHOT OF THE MONTH

It's a bird! It's a plane! It's the SFPD!



### Artist's Statement

I was playing Driver (MacSoft, [www.wizworks.com/macsoft](http://www.wizworks.com/macsoft), \$29.95), and the cops were chasing me. They made a downhill jump, landed on a car coming uphill, shot up 100 feet into the air, and then traveled about 500 feet before coming down hard!—George Luong

Think you can do better than this? Send your best screenshots to [letters@macaddict.com](mailto:letters@macaddict.com) with the subject line “Screenshot of the Month.” Tell us your name, the name of the game you're playing, and just what the heck you were trying to do.

Titanium cards enables pixel shading and vertex shading (allowing objects to interact with their surroundings in real time) to run on the graphics processing unit (GPU). According to nVidia, the GeForce4 MX supports pixel and vertex shading, but offloads many of these tasks to your Mac's CPU, thus slowing performance.

nVidia's top-of-the-line GeForce4 Titanium has all the gusto of the GeForce4 MX, plus more and faster RAM (128MB of 325MHz DDR memory). It also has the second-generation nfiniteFX engine, which offers dual vertex shaders (as opposed to a single vertex shader, as on the GeForce3), and improved pixel shading and bump mapping.

Now that Power Macs can handle cutting-edge graphics technologies, it's up to Apple to support them and game developers to incorporate them in games. At a recent nVidia press event, Apple demonstrated bump mapping, pixel shading, and vertex shading in Mac OS X, although it wouldn't tell us when it would release OS updates to support these features. With any luck, the wait won't be long before Mac games become the envy of Xbox gamers.—Cathy Lu

## Stacking the Cards

Here's the lowdown on what these new graphics cards offer and how much they cost.

	THE JACK OF GRAPHICS	THE QUEEN OF GRAPHICS	THE KING OF GRAPHICS
CARD	ATI Radeon 7500	nVidia GeForce4 MX	nVidia GeForce4 Titanium
MEMORY	32MB DDR	64MB DDR	128MB DDR
DISPLAY CONNECTORS	ADC and VGA	ADC and VGA	ADC and DVI
CARD COMES STANDARD WITH	800MHz G4	933MHz G4 and Dual 1GHz G4	You wish; this is a build-to-order option
COST	Subtract \$100 if ordering one of the two high-end G4s	Add \$100 if ordering the low-end G4	Add \$350 for the low-end G4; add \$250 for the high-end G4s



# how to

Because inquiring minds have the right to be inspired.

## Design Pages with AppleWorks

by Kris Fong



This stuff's for the pros.



It'll take some effort, but you can do it.

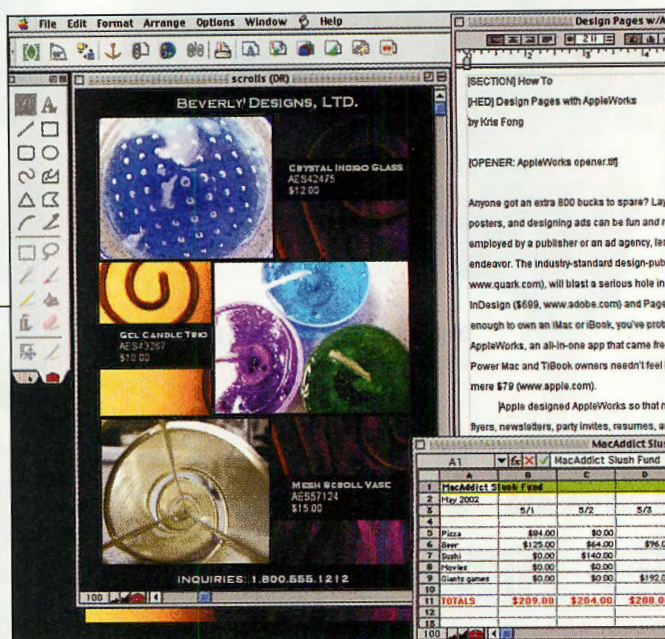


The fundamentals, if you will.

Anyone got an extra 800 bucks to spare? Laying out pages for magazines, creating posters, and designing ads can be fun and rewarding experiences, but if you're not employed by a publisher or an ad agency, learning the trade can also be an expensive endeavor. The industry-standard design-publishing app, QuarkXPress (\$869, [www.quark.com](http://www.quark.com)), will blast a serious hole in your pocketbook, as will Adobe's InDesign (\$699, [www.adobe.com](http://www.adobe.com)). However, if you own an iMac or iBook, you've probably noticed a program called AppleWorks that came free with your computer, thanks to Apple. Power Mac and TiBook owners needn't feel left out; you can buy AppleWorks for a mere \$79 ([www.apple.com](http://www.apple.com)).

You may already use AppleWorks to write resumes and manage finances, but you can also use it to easily create flyers, newsletters, party invites, posters, and other design-oriented documents. Though AppleWorks isn't nearly as sophisticated as Quark or InDesign, the program comes with many of the tools you need for laying out photos, graphics, and text in professional-looking pages. It also gives you the opportunity to experiment, hone your design skills, and build up a portfolio so you can nab a *real* project. Of course, if you're seriously considering a career in graphic design, make that Quark or InDesign investment!

Here, we demonstrate how we created our Big Sur promo to show you the basics of designing page layouts. In case you don't have the time to commit or just want to get your feet wet, we also tell you how to design a great-looking page fast using an AppleWorks template.



You may already use AppleWorks for its word processor and spreadsheet, but you can also use it to create ads and brochures.

## In This Section

### p67 Design an Ad

You don't need Quark or InDesign to create page layouts for flyers and brochures. With AppleWorks, a little know-how, and some design taste, anyone can don an art director's cap. Learn how to build our Big Sur promo shown on p67.

### p70 Flyers in Five Minutes

Need to turn a concept into a reality and have no time to spare? Luckily for you, AppleWorks comes through in a pinch. It's loaded with templates that allow you to plug in graphics and modify text to create pages—no design skills needed.

## Five Elements, Five Alternatives

"I hate it!" These three little words often spark the kind of heated arguments you'll inevitably hear at some point if you deal with clients in your artistic endeavors. To survive in the design industry, you have to grow a thick skin and learn the art of accepting the alternative choice, even if it isn't your favorite. Therefore, before

presenting your work to a client, always mock up a few alternatives.

We laid out our design elements in five different ways: the four shown below, plus the layout in our "Design an Ad" how-to on p67. We liked the latter best, though we're sure some of you will disagree. Like we said, this is why it's important to offer alternatives.





# Design an Ad



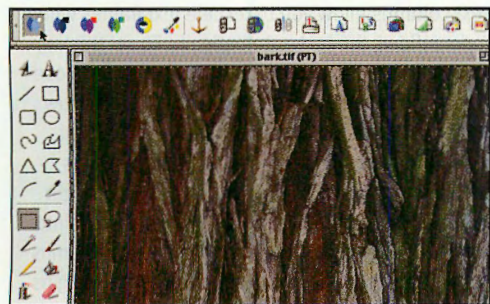
## WHAT YOU NEED

- AppleWorks 6
- Any image editor with layer support
- AppleWorks Tutorial Files (on the Disc)

Ever wonder how designers create text columns, make words flow vertically up a page, frame photos, or wrap text around graphics? Stop wondering and start doing. Here's how we created our mock one-page advertisement for travel in Big Sur, California, using four photos and some text—grab the text and tutorial photos off the Disc. Note: This lesson offers design fundamentals for creating printable pages. However, professional ad work requires knowledge of crucial details, such as cut lines, four-color separations, and various publishing criteria—and that's another how-to entirely.

## 1 Create a Soft Backdrop

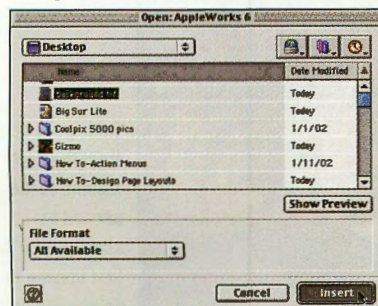
Since Big Sur is known for its vast forest, we used a photo of tree bark (bark.tif) as our ad's background. If we left the photo untouched, the mottled bark would make the overlaid text unreadable. But you can lighten the photo to make overlaid elements stand out. Drag bark.tif onto the AppleWorks application icon to open the photo in a Painting document. Select all (Command-A) and then click the Lighter button (the leftmost button in the Button Bar) three times to lighten the image. Select Save As from the File menu, choose TIFF [QT] from the File Format drop-down menu, and save the image as background.tif.



Use AppleWorks' Painting mode to tweak photos and art (we lightened a photo here) before adding them to a document layout.

## 2 Lay Out the Background

Close the background.tif window. AppleWorks presents a Starting Points dialog. Click the Drawing icon to open a new Drawing document. Under the File menu, select Insert, choose All Available from the File Format drop-down menu, navigate to your background.tif file, and click Insert to bring in the bark. Select the arrow tool in the Tools window, click the image, and use the cursor or your keyboard's arrow keys to move the photo until it covers the entire document.



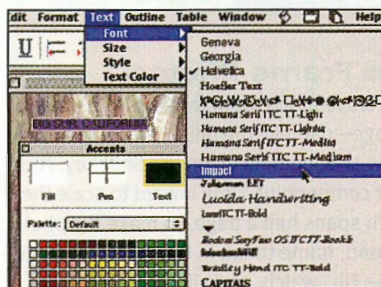
When inserting files, select All Available from the File Format drop-down menu to find background.tif.



Like our ad? Then create your own—grab the tutorial files off the Disc and follow along!

## 3 Type a Headline

Click the Color tab in the Accents palette (the leftmost tab), click the Text swatch, and then click the black square in the palette to select it as the text color. Select the text tool (labeled with an A) in the Tools window, click anywhere in the document, and type **BIG SUR, CALIFORNIA**. Select the entire text line (Command-A). Under the Text menu, select Font and choose a broad, bold font from the list (we used Impact). To make the headline bigger, select Size from the Text menu, choose Other, type 88 in the Font Size field, and click OK.



Click the bold button (labeled with a B) in the Button Bar to give the headline extra heft.

Choose any big, bold font from the Font list—AppleWorks displays each name in its designated font to eliminate guesswork.

## 4 Stylize the Headline

For more impact, create a shadowed vertical headline. Using the arrow tool, click the headline, then click the Rotate 90 button (the 90-degree arc) to reorient the headline vertically. If your monitor can't display the full document, decrease the scale percentage (click the number in the document's bottom-left corner to open the menu) until you get a full overview. Move the headline to the left side of the page and center it from top to bottom—this is the shadow. To create the actual headline, copy the text (Command-C) and paste in a duplicate (Command-V). Under the Format menu, select Text Color and choose a dark gray from the palette. Under the Options menu, select Turn Autogrid Off, then use the arrow keys to offset the text slightly up and to the left of the shadow headline.

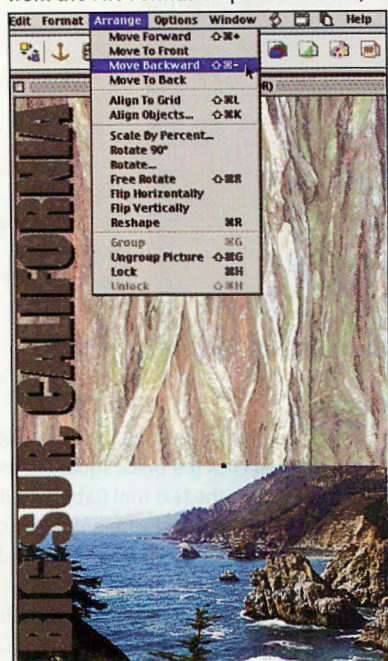


Make a copy of the headline, change its color, and offset it to create a strong shadowed effect.



## 5 Insert Photos

This ad uses two scenic photos, one of the California coastline and the other of McWay Falls. To bring in the coast image, select Insert from the File menu, choose All Available from the File Format drop-down menu, navigate to coast.tif, and click Insert. Move it flush with the bottom of the page, partially concealing the headline.



To bring the headline back into view, select Move Backward twice from the Arrange menu to push the photo layer behind the text. Bring in falls.tif using the Insert command, then move the photo into the document's upper-right corner.

Use the Arrange menu to rearrange the layers from top to bottom. Here we moved our photo beneath the two-layered headline.

## 6 Resize and Frame Photos

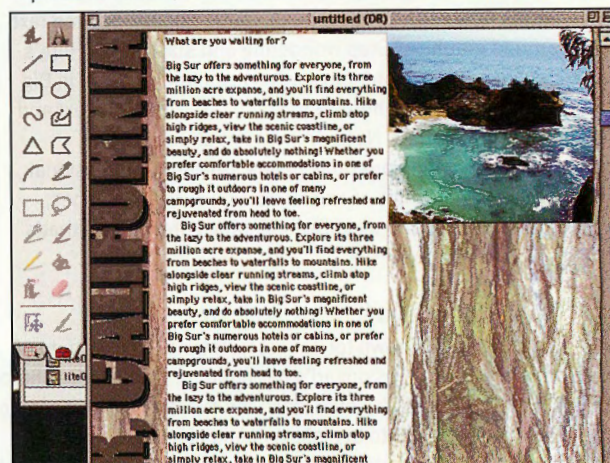
The photos don't leave much room for text. No problem. Just resize an image—namely, the falls. Select the arrow tool from the Tools window and, holding down the Shift key, click the falls photo's lower-left corner point. Drag inward to scale the photo down until the width spans half a page. To make the photos pop out from the background, frame them. In the Accents palette, click the Color tab, click the Fill swatch, and click the black color swatch. Then click the falls photo, click the Line Style tab in the Accents palette (the rightmost tab), and click 1 pt. (point) to create a border frame. Frame the coast photo using the same method.



Using the Line Style palette, frame a photo with a skinny black border to give the image a clean, elegant edge.

## 7 Add Body Text

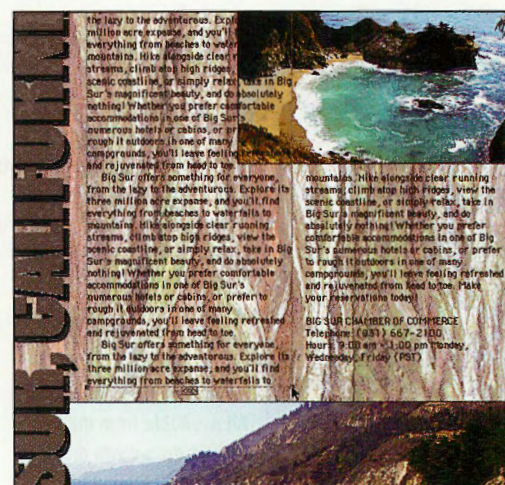
Double-click our LongText file to open it in SimpleText, select all (Command-A), copy the text (Command-C), and then close the file. In AppleWorks, select the text tool, then click and drag the cursor to draw a text frame next to the headline: from the top of the page to just above the coast photo in height, and to the document's middle point in width. Then paste in the text (Command-V). Because the text is longer than the frame you created, the text spills beyond the frame. Rather than cut and paste the text into separate columns, create linked text columns for more flexibility.



To add text, simply create a text frame and paste in your text—you can modify its layout afterward.

## 8 Create Linked Columns

Linked text columns allow you to rescale text frames while AppleWorks reflows the text automatically. To set this up, select the arrow tool, click the text to select the frame, and choose Frame Links from the Options menu. Click the small, boxed arrow that appears at the frame's bottom, and then draw a linked text frame by clicking and dragging across the space under the falls photo and over the coast image. Click the first frame's lower-right corner point and drag it above the coast photo to flow the text into the second text frame. Use the arrow tool to scale the text columns to the same width, and position the frames so their space margins are similar.

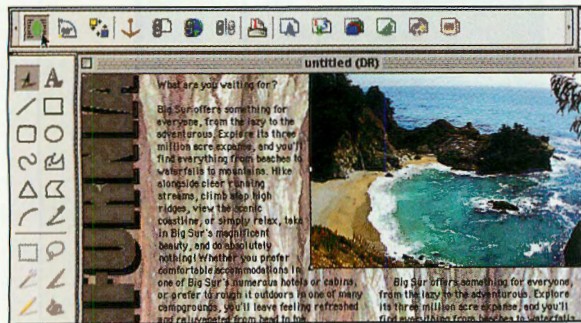


Reflow the text from the first column to the second by scaling back the first column to its original size.



## 9 Wrap Text Around Photos

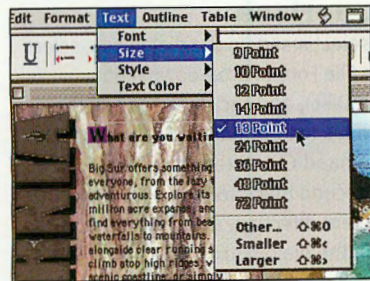
You've got the text laid out, but some of it spills onto the falls photo—horrors! You can easily wrap text around graphics, giving your design a more organic flow, instead of having to rethink your boxed layout. Using the arrow tool, click the falls photo, and then click the Text Wrap button (it looks like a green football between lines) in the Button Bar to flow the text around the photo. Resize the text frames if any text gets cut off at the end.



Instead of laying out design elements in a rigid, boxy pattern, wrap text around graphics for better flow.

## 10 Finesse the Text

You might want to give certain text more emphasis—say, the opening line and the contact information. Select the text tool, click the second text column, drag the cursor to highlight the Big Sur Chamber of Commerce's contact info, and click the Bold button. Next, using the text tool, click the first column, highlight the first line of text, and click the Bold button. Highlight just the *W* in the word *What*, then select Text > Size > 18

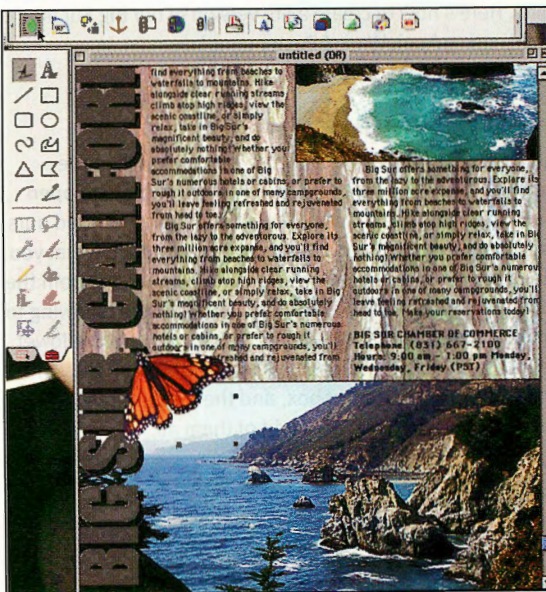


Point to create a larger lead-in character.

Highlight important parts of the body text by altering its font size and style.

## 11 Add an Eye-Catching Graphic

Though the promo ad looks good, it needs a punchy image to capture roving eyes. A photo of a bright monarch butterfly (a popular Big Sur resident) will do the trick, but you don't want another boxed photo. No problem—you can use Photoshop or comparable image editor to create a piece of pseudo clip art with a transparent background. However, if you insert the monarch file just as you did the other photos, AppleWorks will add a white background where the transparency should be. Instead, open monarch.psd in any layer-supporting image editor, highlight the monarch layer, select all, copy it, switch to your AppleWorks ad, and paste in the graphic. Move the butterfly slightly over and to the right of the word *Sur* as pictured, click the Text Wrap button to flow text around the photo, resize the text columns if words get chopped off, save the page, and admire your gorgeous promo.



To grab readers' attention, add a catchy graphic or a spunky contrasting color.

## Competency Counts

**Y**ou might not have the same software that the pros are using—yet—but you can build a competent reputation in the eyes of your clients by taking care of the following tasks *before* you hand in your work:

**Ask for Input** Don't start wielding any design tool without first asking your client for input. Getting a feel for what the client likes and dislikes will prevent time-consuming redos at the last minute. Ask about the target audience, company and/or product image, color palette preferences, ad usage, and so on.

**Copyedit Your Text** Some clients may hand you text that's littered with typos and grammatical errors. Read through all text *before* you start laying things out. You can correct careless mistakes (typos, missing punctuation, and so forth), but talk to your client before you start rearranging sentences.

**Create Mock-Ups** Before you forge ahead on your Mac, sketch a few mock-ups on paper so the client can get a visual overview of what works and what doesn't. This feedback will steer you in a suitable direction.

**Fix Photos** Correct problem photos and graphics so all the images on a page are similar in brightness, tone, and sharpness. Use TIFF photos only—not JPEGs, which tend to look pixilated in print due to the compression. If your client supplies product shots, make sure the image colors are accurate.

**Proof Your Work** We're stating the obvious, but after spending multiple hours with your eyeballs glued to the page, you may stop noticing the little things. Is there an extra space between two words? Are your photo boxes perfectly aligned? Is the URL correct? Check every square inch of your document before handing it in.



## Flyers in Five Minutes



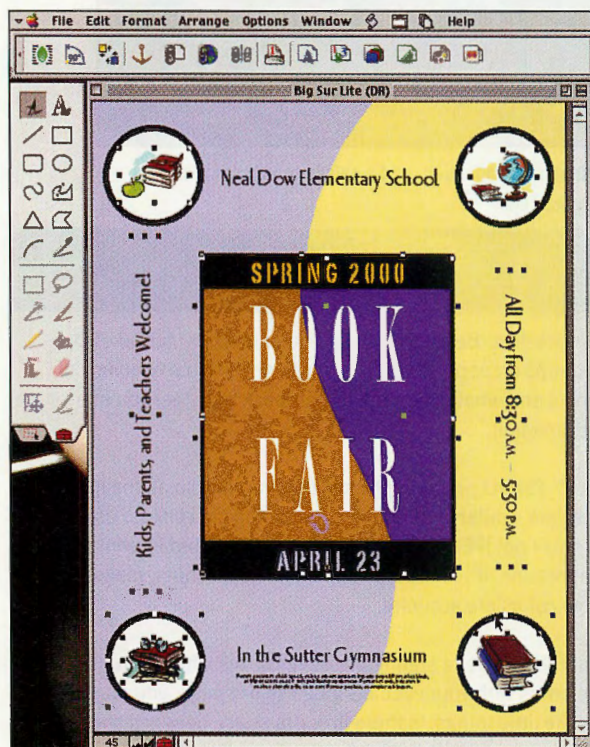
### WHAT YOU NEED

- AppleWorks 6
- AppleWorks Tutorial Files (on the Disc)

If you're strapped for time, you can quickly create posters, brochures, greeting cards, flyers, and more in AppleWorks by simply modifying one of the included design templates. Though these templates aren't as complex as the layouts in "Design an Ad" (p67) they can help you get those small projects done in a jiffy. Here's how to create a lite version of our Big Sur ad (pictured right) using AppleWorks' Poster template.

### 1 Modify a Template

Launch AppleWorks and click the Templates tab in the Starting Points window. Click the Poster template to open the file, then save it as a new AppleWorks document (we titled ours Big Sur Lite). The template's design is too complicated for what you want, so delete some of its elements. Select the arrow tool from the Tools window and, holding down the Shift key, click the following to select them all: the two vertically aligned sentences, the two lower circles, the four graphics inside each circle, the Book Fair text, the gold curvy backdrop in the center box, and the purple curvy backdrop. Press the Delete key to get rid of them all.



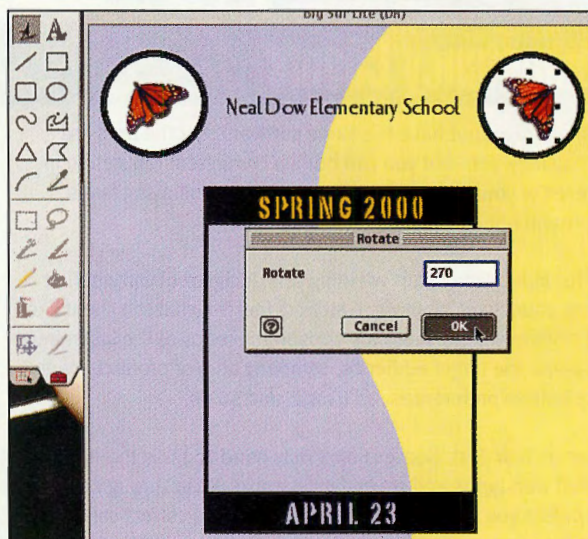
Get rid of any unwanted template elements by selecting and deleting them until you have a workable foundation.



AppleWorks includes prefab templates that allow you to plug in your own elements and print out a project with ease.

### 2 Insert the Butterflies

From the File menu, select Insert. In the dialog box, select All Available from the File Format drop-down menu, navigate to butterfly.tif (on the Disc), and click Insert to add the photo. Use the arrow tool to move the butterfly inside the top left circle. Then make a copy (Command-C), paste in a second butterfly (Command-V), and move the second bug into the upper-right circle. To point the butterfly in a different direction, select Rotate from the Arrange menu, and type 270 in the dialog box. Click OK.

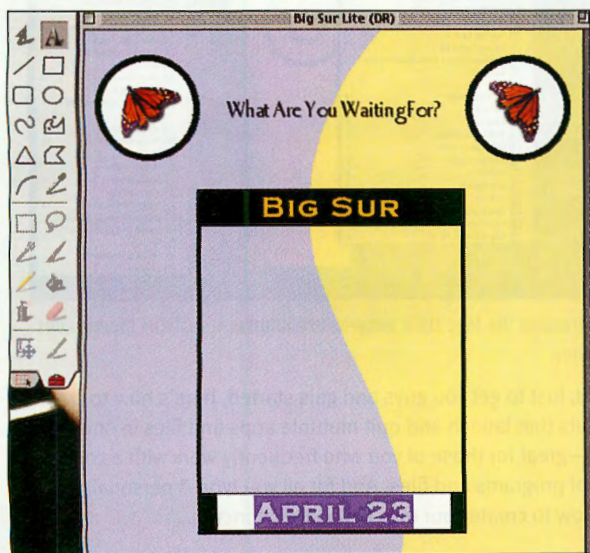


Create a page quickly by inserting your own artwork or photos into the preexisting design and modifying their placement.



### 3 Change the Headlines

Select the text tool, select the *Neal Dow Elementary School* text, select all (Command-A), and type *What Are You Waiting For?* to replace it. Do the same for the other headlines, replacing *Spring 2000* with *Big Sur* and *April 23* with *California*. You can also change the text font and size from the Text menu (we chose Copperplate Gothic Bold for the location text).



Type over existing text lines with your own words. Feel free to change fonts, styles, and sizes.

### 4 Add the Waterfall

Insert *waterfall.tif* just as you did *butterfly.tif*. Use the arrow tool or your keyboard's arrow keys to center the image under the *Big Sur* header. Select the arrow tool and, holding down the Shift key, click *California* and its black background. Move both graphics up to the waterfall photo's bottom edge. Click the black border and, using the cursor, expand the border so it frames the waterfall image's width, the top of the *Big Sur* box, and the bottom of the *California* box. Extend both black text boxes by clicking and dragging each edge until both headers are the same width as the image.



Use the arrow tool to move and reshape a template's graphics. Here we stretched a border box to reframe our photo.

### 5 Paste In the Text

Open our Text file in SimpleText, highlight the contact info at the bottom, and copy it. In AppleWorks, select the type tool, click the tiny text at the bottom of the page, select all (Command-A), and paste in the contact info. Select all again, select Size and then Other from the Text menu, type 22 in the Font Size field, and click OK. Use the arrow tool to stretch the text box so the contact info spans the entire document's width in one line, then move this line to the bottom of the page. Repeat this step, replacing the Sutter Gymnasium text with the body text in our Text document. Change the font size to 24, stretch the text box to span the width of the waterfall image, place the text midway between the box graphic and the contact info, and save your file. Fini!



After bringing in your text, change its font size, and then use the arrow tool to modify the text box's size and placement.

## AppleWorks Workarounds

Though AppleWorks is a mighty force when it comes to word processing and spreadsheet handling, the program's oddities may throw you for a loop when you're using it for design work. If you find yourself in these predicaments, here's our advice.

**Ack! Where did my headline go?** We don't know why, but if you rotate a white headline 90 degrees, it disappears, though the text box remains. This aberration doesn't occur with any other color. Therefore, if your design calls for a vertical text treatment, don't use white—use the faintest shade of gray instead.

**I can't align my text or photos perfectly!** AppleWorks' Autogrid feature is supposed to help you keep design elements aligned on the same grid. Yeah, right. The default setting is on. Turn it off via the Options menu so you can align things precisely, pixel by pixel—the right way.

**What's with the text gaps around my clip art?** AppleWorks sees all graphics as boxes, regardless of clipping paths or transparent backgrounds. For example, when you wrap text around, say, a cutout of an orange, it doesn't flow around the fruit's curves. Our advice? Get used to it or get a real design app.

Senior Editor Kris Fong no longer has sticky fingers—the days of physically cutting and pasting together layouts are over!



## Work Faster and Easier with ACTION Menus

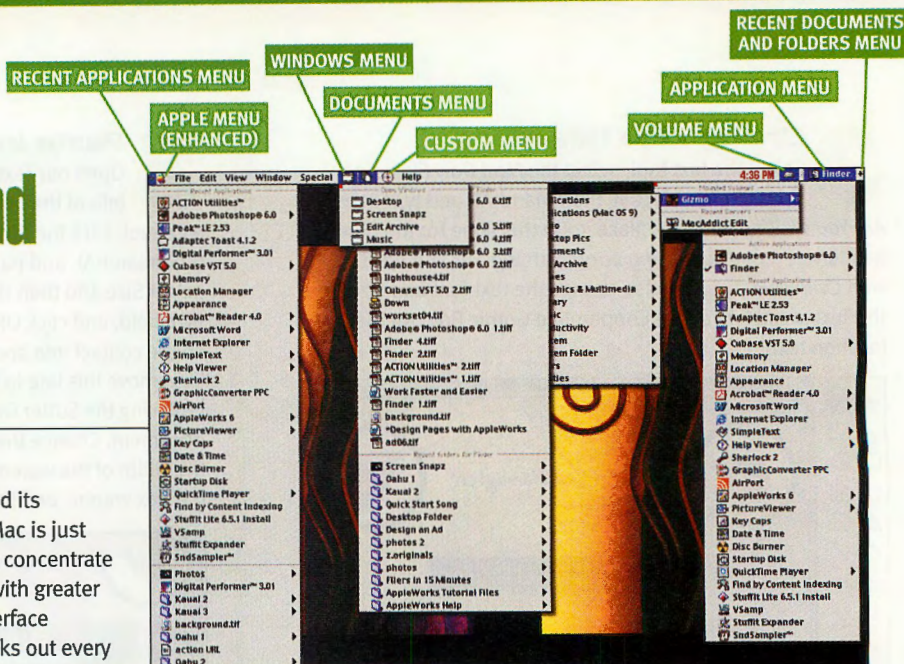
by Kris Fong



Find ACTION Menus 1.0.3 and instructions on how to get your very own serial number for free on the Disc.

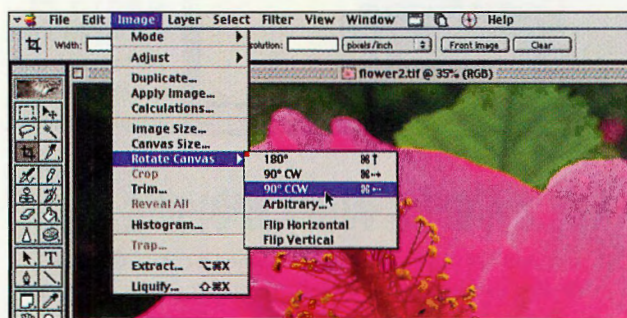
**W**hy do we choose the Mac? Beyond its elegance, power, and style, the Mac is just plain simple to use, leaving us to concentrate fully on our projects and activities and work with greater efficiency, rather than having to fuss with interface idiosyncrasies. But if you're the type who seeks out every application shortcut and strives to fly through workloads at breakneck speeds, you may already know about Power On Software's ACTION Menus (\$29.95, [www.poweronsoftware.com](http://www.poweronsoftware.com)). And even if you don't, guess what, folks? This month we're giving the full enchilada to you for free on the Disc!

Though it functions only in pre-Mac OS X systems, ACTION Menus lets you take control of Mac OS menus, allowing you to dictate what's in them, and tailor functions to accompany the work



**Order up!** If you appreciate the Mac OS's easy-to-use interface, ACTION Menus adds even greater efficiency.

at hand. Just to get you guys and gals started, here's how to create work sets that launch and quit multiple apps and files in one fell swoop—great for those of you who frequently work with a core group of programs and files. And for all you type-A personalities, learn how to create your own keyboard shortcuts.



If your favorite app lacks shortcuts to frequently used commands, use ACTION Menus to create your own.

## Create Custom Shortcuts



### WHAT YOU NEED

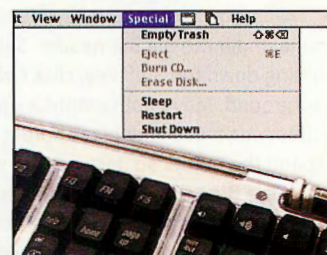
- ACTION Menus 1.0.3 (on the Disc)

If you're a Mac-savvy individual (and what *MacAddict* reader isn't?), for years you've been copying (Command-C), pasting (Command-V), saving (Command-S), and quitting apps (Command-Q) almost as routinely as you get out of bed and brush your teeth. You probably also wish you had a few particular shortcuts (keyboard commands) to perform frequently used functions that Apple and other software developers didn't build into their apps. You have the power to change that. Here's how to create your own keyboard shortcuts with ACTION Menus.

### 1 Determine Your Needs

Maybe you're a Photoshop wiz who wants quick keyboard access to the Fill command. Or you're a writer who's tired of pulling up the word count command via a menu in Word.

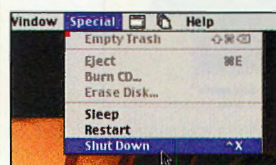
Why not create your own shortcut? We'll demonstrate with an item from our own wish list: Our Apple Pro keyboard lacks the familiar old power button, and we miss being able to shut down our Mac without touching the mouse. We can fix this by creating a shortcut for the Special > Shut Down command.



Our power key-less Pro Keyboard could use a Shut Down shortcut.

### 2 Create the Shortcut

With ACTION Menus installed, highlight (but don't click) the menu command for which you want to create a shortcut. Then simply press a memorable key combination, and the combo appears listed next to the menu command. Now move your cursor off the menu and press the key combo to test out your shortcut. If you change your mind, highlight the menu command and press the Delete key to undo the shortcut assignment. Shortcuts can combine any modifier key or keys (Command, Option, Control, Shift) plus one alphanumeric key. Just make sure you don't assign a key combo that already belongs to another function in that app, or you'll unassign the original shortcut.



Just highlight a shortcut-free command, press a key combo (we chose Control-X), and *bam*, you've got a shortcut.



# Create Work Sets



## WHAT YOU NEED

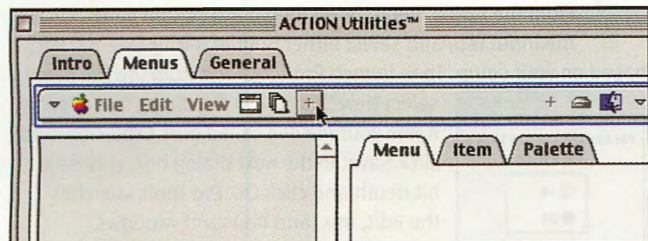
- ACTION Menus 1.0.3 (on the Disc)

**W**henever you fire up your Mac, chances are you use a particular set of applications and files every time—possibly even more than one set. Rather than launch each item individually, you can create custom menus and open multiple apps and files all at once instead of pecking through the Finder.

For example, if you're a one-person video-production company (with a G4 and memory up the wazoo), you might want to launch (sadistically) Apple Final Cut Pro, Adobe After Effects, Discreet Combustion, MOTU Digital Performer, Discreet Cleaner, and a work-in-progress group of video and sound clips for a project. When it comes time to tweak the video box, you need to quit all these apps and files, and then launch Adobe Photoshop, Microsoft Word, QuarkXPress, Adobe Illustrator, Alien Skin Software's Eye Candy 4000, and a slew of graphic files. Sound like you? Here's how to create custom menus for launching and quitting multiple apps and files.

## 1 Create a New Menu

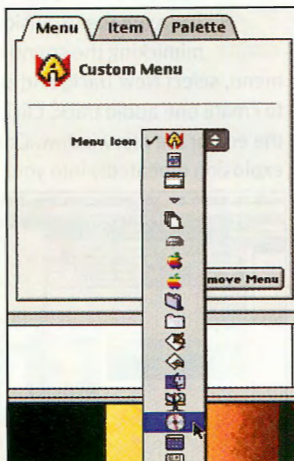
With ACTION Menus installed, from the Apple menu, select Control Panels, then ACTION Utilities to open the panel. Click the Menus tab, click the Menu tab in the panel, and then click either of the plus signs (+) in the panel's menu bar to create a new menu in that location. The ACTION Menus icon appears in the Mac OS menu bar by default.



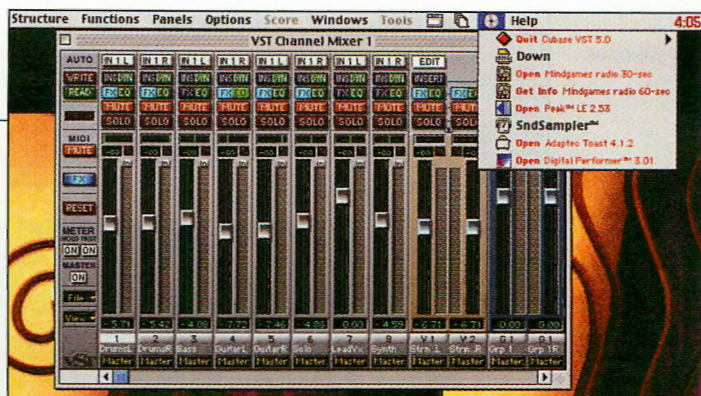
Choose where on the menu bar to stick your new menu by clicking either of the plus signs (+).

## 2 Change the Icon

If your name is, say, Adam, Ashley, or Alpo, the A icon might work for you. The rest of us may want to choose something else. Click the Menu Icon drop-down menu and choose an appropriate icon for your work set. We were creating one for our music-recording stuff, so we chose the CD icon.



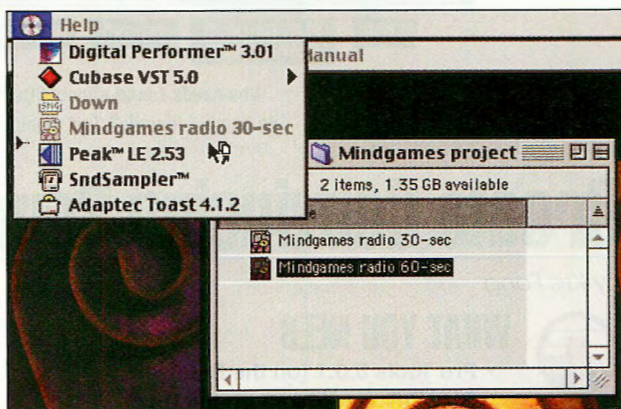
If you're creating more than one work-set menu, choose a relevant icon to set them apart.



Rather than waste time launching and quitting your daily apps and files one at a time, handle them all at once via a custom menu.

## 3 Load the Menu

To load each program and file you want the work set to include, just drag and drop its icon or alias onto your new menu-bar icon (the Finder must be active). To remove any menu item, highlight it and press the Delete key. This will cross it out in red, and you won't see it the next time you drop down the menu.



Drag and drop the desired apps and files onto your new menu icon to load them.

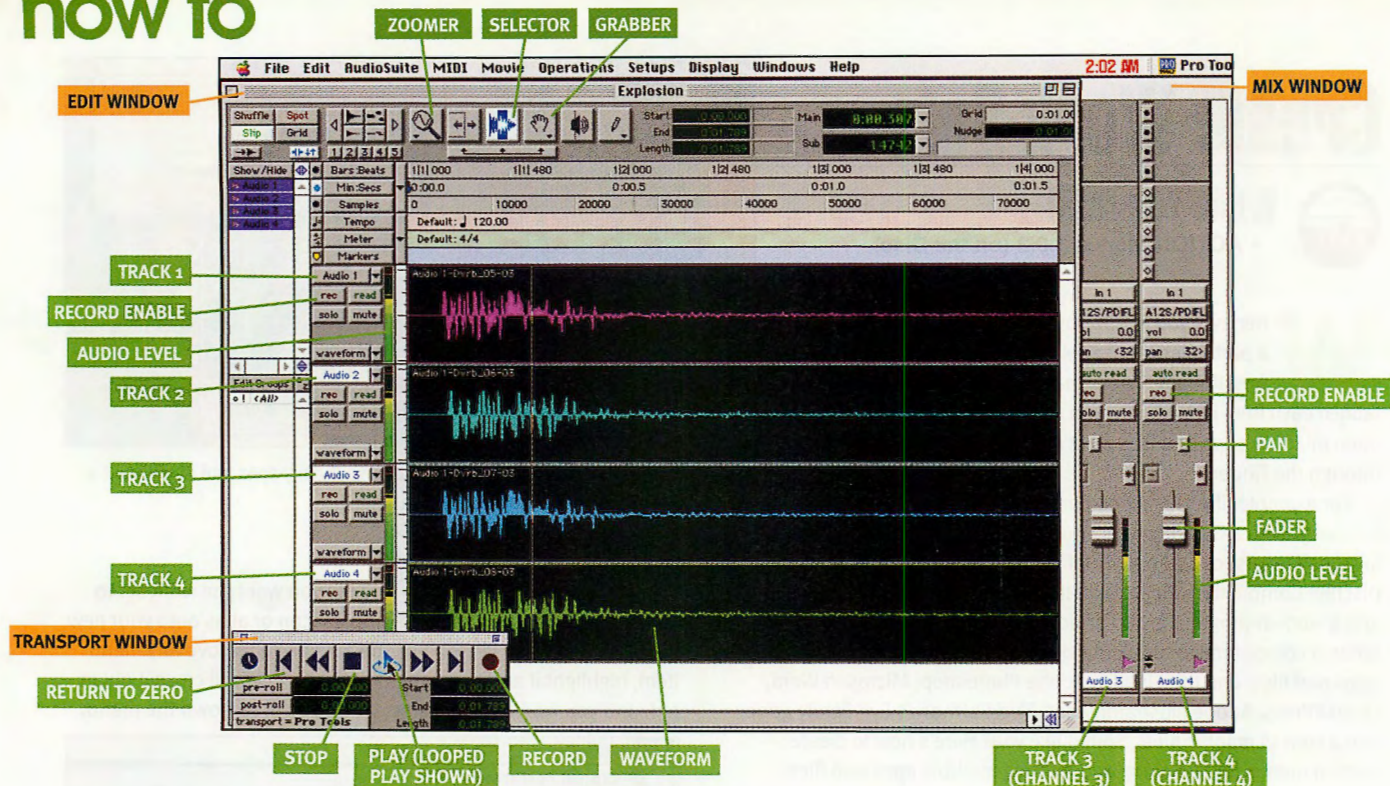
## 4 Launch Your Set

Click your menu icon to drop down the menu, highlight an item you want launched, and type *o* (for open); ACTION Menus will tag the item with a launch directive. Repeat this process with any other items—you can launch everything or choose specific items to launch. Then move your cursor off the menu and your Mac will launch everything you tagged. To quit items, highlight them and type *q* (for quit), then mouse off the menu. If you want, you can throw all of your work sets into one menu, and dictate what to launch and what to quit from there.



Pressing *o* tags menu items to open; pressing *q* tags them to quit. You can also mix tags in any menu.





Who needs sound-effects CDs, samples, or the real deal when you can be da bomb—literally? Just manipulate your own voice to mimic an explosion.

## Create Convincing Sound Effects with Your Voice

by Kris Fong



### WHAT YOU NEED

- Pro Tools 5.0.1 (on the Disc)
- DUY Z-Room (demo on the Disc)
- Built-in or external mic

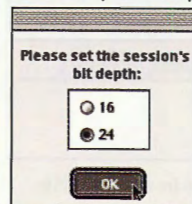
The summer blockbuster movie season is just around the corner, and you know what that means: It's time to invest in a pair of earplugs to keep 100 or so decibels of gratuitous explosion fu at bay. Many moviegoers marvel at watching big things blow up onscreen, but a big part of what makes these special effects so grandiose is the sound.

While you can buy plenty of sound-effects CDs and samples via the Internet, most movie studios prefer to have sound effects created expressly for their movies. If you're looking to add an explosive sound to your work, why not take their lead and create your own explosion? Here's how you can record and manipulate your own voice to turn it into a deep bomb blast. All you need is a mic and Digidesign's Pro Tools, the most widely used audio-recording app in professional recording studios, and this month we're giving the full program to you free on the Disc.

Take a listen to our raw voice (before) and explosion effect (after) audio files (in the Create Sound Effects folder on the Disc), using QuickTime Player. Then install the software and follow our instructions to create your own, bearing in mind that your settings may differ from ours due to differing vocal nuances. (Note: If you're a current Pro Tools user, installing Pro Tools 5.0.1 will disable your current Pro Tools software.)

### 1 Set Up a Session

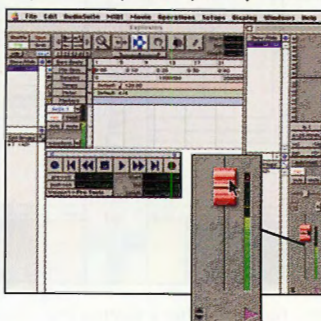
From the Apple menu, open the Sound control panel, click the Input tab, and select either Built-in Mic or External Mic, based on your setup. Then launch Pro Tools and from the File menu, select New Session. In the dialog that appears, name your file (we called ours Explosion) and click Save. In the next dialog box, choose a bit depth and click OK. Pro Tools launches the edit, mix, and transport windows.



Choose a 24-bit rate if you're connecting a mic via an audio card or device; otherwise choose 16 bits.

### 2 Record Your Voice

To create the explosion's foundation, record yourself mimicking the sound of a bomb exploding. Under the File menu, select New Track, and click Create in the resulting dialog to create one audio track. Click the record-enable button in either the edit or the mix window. Check your audio level by voicing an explosion repeatedly into your mic, then adjusting the fader in the



mix window until you see a strong green signal without any red. Press record in the transport window, and then press play to begin recording. Voice five or six explosions, and press stop.

Let your audio level max out in the green but avoid the red, or you'll ruin your recording.

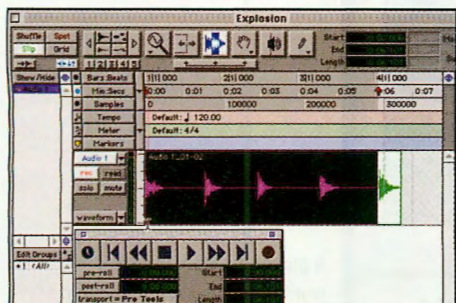


Find the full version of Pro Tools 5.0.1, a Z-Room RTAS demo, OMS 2.3.8, and our Create Sound Effects example files on the Disc.



### 3 Isolate Your Best Take

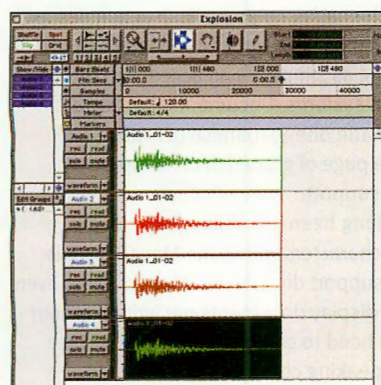
Click the record-enable button again to disable recording, and then press play to hear your recording. Decide which take is your best and get rid of the rest. To do this, select the zoomer in the edit window and click on the audio wave to enlarge the waveform. Use the selector to highlight all areas of the waveform *after* your best take, and press the Delete key to erase the recording. Highlight the waveform area from the beginning to just before your best take and delete it. Then use the grabber to move your recording snippet to the beginning of the timeline.



Record a series of vocal explosions, and then isolate your best take by deleting the bum ones.

### 4 Spawn Three Clones

To give your sound fullness, create copies of your recording. Select the zoomer and click on the waveform until you clearly see the receding waves toward the end of your recording. Under the File menu, select New Track, type 3 in the New Audio Track field, and click Create to create three audio tracks. Click track 1, select all (Command-A), and copy it (Command-C). Click track 2, click the

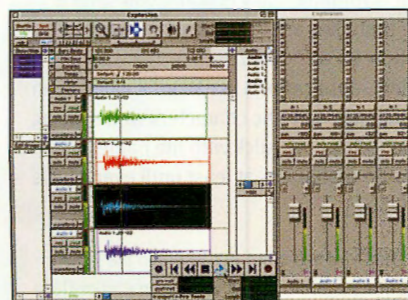


return to zero button in the transport window, and paste in the copy (Command-V). Click track 3, click return to zero, and paste in another copy. Repeat with track 4 to paste in a third copy.

To make one voice sound bigger, make three copies of your recording so you have four audio tracks.

### 5 Create a Stereo Field

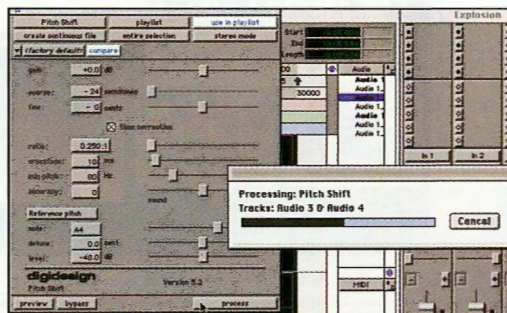
Select the grabber and nudge track 2's waveform slightly to the right in the edit window so it starts just after the other tracks. Do the same with track 4. In the mix window, move track 1's pan slider (the left-right stereo control) all the way left, and track 2 all the way right. Pan track 3 slightly to the left, and track 4 slightly to the right. Press play to hear your voice in stereo. To loop the sound, highlight any of the four waveforms, Control-click the play button, and then press play.



Create a stereo effect by offsetting two tracks and then panning all four tracks at different points.

### 6 Drop the Pitch

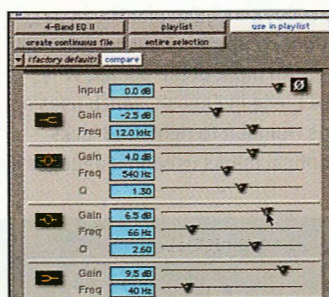
Now for the fun part. To make your voice recording drop to a deep rumble, change its pitch. In the edit window, select all four tracks' entire waveforms (click return to zero and then press Command-A). From the AudioSuite menu, select Pitch Shift to open the effect. Click the Preview button to hear your recording, and move the Ratio slider to the left until your voice sounds completely guttural. Click Process to alter your waveforms with the effect, and then close the window.



Puberty isn't the only thing that can deepen your voice; check out Pro Tools' Pitch Shift effect.

### 7 Process to the Extreme

To get the most sonic bang out of your recording, compress the audio. Under the AudioSuite menu, select Compressor, click Preview, adjust the Ratio slider to control the amount of compression, crank up the Gain to maximize volume, and click Process. To shape the sound, from the AudioSuite menu, select 4-Band EQ II. Click the Preview button and crank up Gain at around a 40Hz frequency in the bottom EQ band—since everyone's voice



is different, use your ears to judge the best level. Set the other EQ bands and increase Gain so that your voice sounds deep and explosive, but not muffled. Click the Process button.

Add more boom by increasing the gain in the EQ's low-frequency ranges.

### 8 Make the Big Boom

To make your explosion sound larger than life, use reverb to add depth. Reverb adds extra sound trails to the original recording, so select more time beyond your waveforms to compensate for the effect. In the edit window, with all four waveforms still highlighted, hold down the Shift key and use the selector to highlight an additional 6 to 8 seconds beyond the waves. From the AudioSuite menu, select Z-Room Stereo, click



Preview, fiddle with the sliders until you get a sound you like, and click Process. Click play to hear your big bang go boom!

Give your explosion depth by adding a rich reverb.





A picture paints a thousand words—in this case, Japanese words—if you set up your Mac to handle multiple languages.

## Make Your Mac Multilingual

by Chris Ott

All those years of Spanish, Japanese, and French lessons might help you make connections with people around the world, but good luck trying to get a computer to translate all the documents your foreign cronies send. Despite the hype surrounding high-tech globalization, computers have traditionally had a rough time communicating with most of the planet. Why? Most computer development took place in English, which uses a small number of characters, reads from left to right, and lacks accents, umlauts, and other diacritical marks used in languages like Spanish, French, and German.

### See No Evil: Extra Languages in Mac OS X

The Mac OS has always provided basic support for Western European languages. For instance, you could press key combinations to type characters like ç, ñ, or ü; install special language fonts to get more characters; or purchase more-complex language kits. With OS X, much of this is built right into the operating system.

OS X ships with support for seven languages—English, French, German, Japanese, Spanish, Italian, and Dutch—and offers support for even more (via free downloads). OS X also supports Unicode, a text standard that streamlines information sharing in practically any language.

In January, Apple made other languages available through Software Update: Brazilian Portuguese, Danish, Finnish, Korean, Norwegian, Chinese (simplified and traditional), and Swedish. To get these languages, launch System Preferences and use Software Update to download the ones you want.

Though in every country the native language is programmed into operating systems, by default most OSs understand only one language at a time. Something as simple as an accent can trip up software designed for English systems. Documents that use a character set other than the Latin one—Japanese or Arabic, for example—generally display a page of gibberish on computers lacking the proper language support.

Luckily for us, Apple has long been a multilingual leader, supporting a host of foreign characters within the Mac OS. Apple has built multiple-language support directly into Mac OS X and even includes some languages to display documents not written in your OS's default language. If you need to connect with the rest of the world beyond your English-speaking compatriots, here are some ways to turn your Mac into a multilingual machine.

### What's in a Name?

Once you set up your Mac to be fluent in multiple languages, we have one word of caution: Use care when naming files. If you're sharing files with someone running Mac OS X, feel free to give your files a name in any language. However, if your recipient is running Mac OS 9 and you send a file named in a language that uses another alphabet, such as Russian, the name will show up as nonsense.

To head off this problem, applications like Word X won't even let you name files with language-specific characters while saving a document. For now, stick with file names that use the Latin alphabet—at least until everyone is running OS X.



Mac OS X lets you use other alphabets in the Finder, but the names might not come through in earlier OSs.



# Activate Language Support



## WHAT YOU NEED

- Mac OS X

**M**acs bought in the United States have English as their default language. But if you want to impress friends with your French prowess or use English as a second language, you can install a fully native version of Mac OS X in any of the languages it supports. This is the way to go if you plan to run your Mac exclusively in one of these languages. However, if English is your main language but you need to read documents sent from, say, clients in Italy, you can make adjustments to the OS so both you and your Mac understand them.

OS X features an International panel, which provides support for multiple languages on one Mac. From the Apple menu, launch System Preferences, then click International to open the panel. Here's how to adjust each individual area of the panel to support multiple languages.

## Change an Application's Language

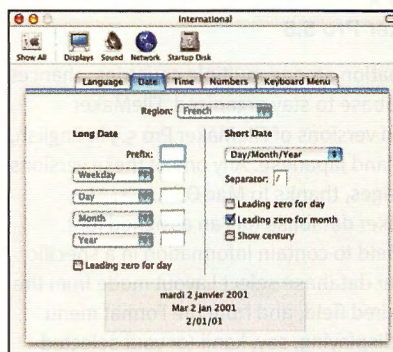
Click the Language tab in the International control panel. This panel lets you set an application's language preferences on the fly. Currently only a few apps, such as iTunes and iPhoto, support it. To switch the language, drag the desired language to the top of the Languages list and fire up a supported app.



You can change iTunes' interface language and even enter song titles in their original language.

## Mind the Numbers

If your business involves exchanging currency figures, or if you want to ensure that your document's date and time formats are in accordance with those of a particular country, select the desired language from the Region drop-down menu in the Date, Time, and Numbers panels. OS X will then format these items accordingly.



Each of these panels also gives you an assortment of formatting options, though we recommend sticking with the default settings.

Select a language from the Region drop-down menu to have your Mac format dates to that country's specifications.

## Change the Keyboard

The Keyboard Menu panel allows you to swap your English keyboard setup for that of another language. This menu remains invisible by default until you activate a second language; a flag icon then appears in the menu bar. Choose as many languages as you like from the panel to load into the menu. Then select a language from the menu to map its corresponding characters to your keyboard.



Choose the flag for the desired language via the Keyboard menu.

# Translate Email and the Web

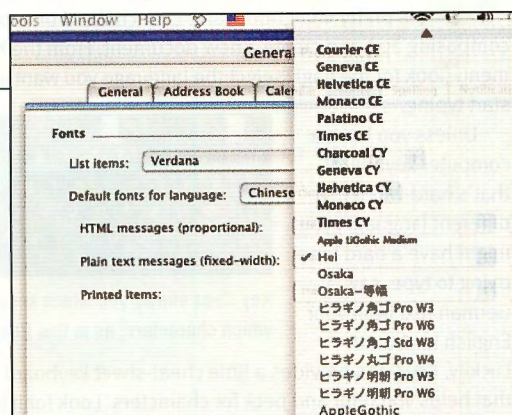


## WHAT YOU NEED

- Mac OS X
- Email application (such as Outlook Express or Entourage)
- Internet Explorer

**Y**ou know all that gobbledygook you sometimes see displayed in email headers or buried in Web-page code? Though we generally ignore it, this code contains information that tells your Mac how to display a foreign language in an email or Web page. As long as the emails you receive arrive with this info intact (the default in most email apps) and Mac OS X supports the language, you shouldn't have a problem receiving or sending messages in it. Just make sure you choose an appropriate font in your email program's preferences or settings to display the language correctly.

OS X's Mail application is also good at handling multiple languages, thanks to its full support of Unicode. As long as your recipient has a Unicode-savvy mail application, you can read, write, and send messages without a hitch in a multitude of languages and alphabets.



Receiving email in the correct language format is easy. Reading it is another story.

Web pages are coded in a similar manner; well-designed sites with international content contain tags that tell Web browsers how to display special characters. All you need to do is select a supported font for your language choice in the browser preferences. Internet Explorer goes a step further by allowing you to set a preferred group of displayed languages in preferences.



## Use Multiple Languages in FileMaker

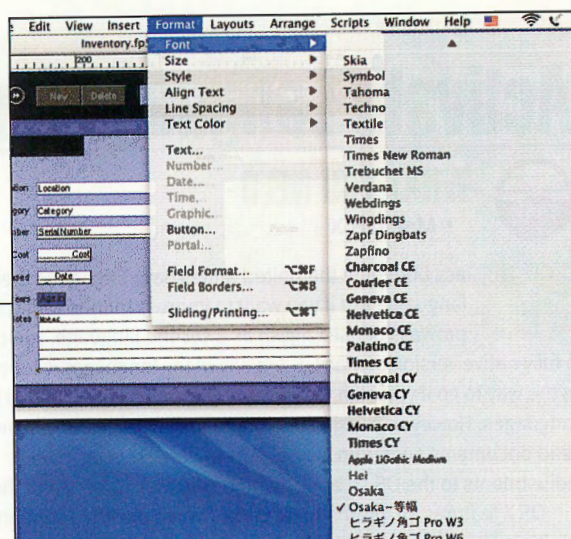


### WHAT YOU NEED

- Mac OS X
- FileMaker Pro 5.5

If you shuttle information among multiple countries, chances are you need a database to stay organized. FileMaker distributes localized versions of FileMaker Pro 5.5 in English, French, Spanish, Italian, and Japanese. Any one of these versions supports multiple languages, thanks to Mac OS X.

Each field in a FileMaker database has an assigned font. If you need a particular field to contain information in a specific language throughout your database select Layout mode from the View menu, click the desired field, and from the Format menu select a font capable of displaying, say, kanji (or your selected language's characters).



FileMaker Pro allows you to assign a font for a particular language in any field.

If you need to have a certain field display data in a variety of different languages, you'll need to adjust the fonts for that field in Browse (default) mode independently each time you enter information. For the sake of your comrades, stick with Apple fonts or cross-platform fonts to ensure compatibility.

## Compose Documents in Other Languages



### WHAT YOU NEED

- Mac OS X
- Any text-composing application (such as Word or an email app)

Once you've set up basic language support for the languages you need, creating a multilingual document is pretty straightforward. Launch Word or another text-composing app and create a new document. From the Keyboard menu (look for the flag), select the language you want and just start typing.

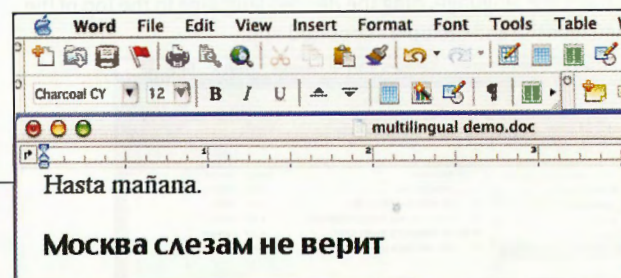
Unless you have a computer keyboard that's hard-wired in a different language, you might have a hard time trying to type, say, German text from your English keyboard.



Key Caps shows you which keys produce which characters, as in this Russian keyboard.

Luckily, Key Caps provides a little cheat-sheet keyboard map that helps you hunt and peck for characters. Look for it in the Applications folder. To type multiple languages in the same document, just switch keyboards by selecting a different language from the Keyboard menu.

Got a global mailing list? You can avoid international incidents by making sure you spell people's names and addresses as they would, instead of just dropping those inconvenient diacritical marks. Just select the appropriate keyboard from the Keyboard menu and type the correct contact info (or cut and paste it in from another source).

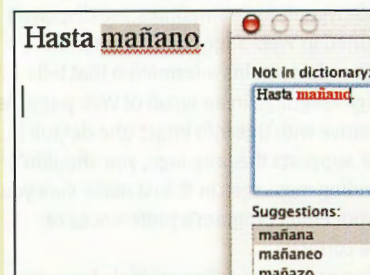


Mac OS X lets you use whatever languages you choose to create multilingual documents in applications like Word.

### Word to the Wise

One of Word X's biggest benefits for linguists is that it includes a thesaurus, hyphenation support, and a spelling-check dictionary for many languages (including Danish, Dutch, French, German, Italian, Japanese, Norwegian, Spanish, and Swedish). To install any of them, double-click the Value Pack Installer on the Microsoft Office X installation CD, choose Proofing Tools in the dialog box, and check the desired languages. German and Japanese language composers will be happy to know that these two languages also come with grammar checking.

If you use multiple languages in one document, you can specify



Identifying text as a particular language activates the proper spelling checker.

which spelling-check dictionary to use. Highlight a section of text composed in one language. Under the Tools menu, choose Language, then select the appropriate language for that block of text. Repeat with other text blocks in different languages—Word can use multiple dictionaries for the same document.



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- **96%** of Mac Addict readers save each issue for future reference.
- **74%** spend from 1-4+ hours with each Mac Addict monthly CD-ROM.
- **33%** spend from 1-8+ hours daily using their Macs for web design.
- Mac Addict readers have been using a Mac on average for 12+ years.
- **57%** rate themselves as advanced to expert user.
- **35%** plan to purchase a new system/system upgrade from Mail Order.

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# ask us

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## Questions?

Submit technical questions or helpful tips directly via email ([askus@macaddict.com](mailto:askus@macaddict.com)) or c/o **MacAddict**, 150 North Hill Dr., Brisbane, CA 94005.

**Q** I installed a brand-new 512MB RAM stick in my Blue-and-White Power Mac G3, but my computer shows that I have only 256MB of RAM. Did I get bad RAM, or did I do something wrong?

**A** The 512MB stick is currently the largest memory card you can buy. Since today's Power Mac G4s have three memory slots, they max out at 1.5GB of RAM. Unfortunately, your Blue-and-White G3 cannot support 512MB RAM sticks due to limitations in the memory subsystem. The largest-size memory card your G3 supports is 256MB, but since your G3 has four slots, you can install four 256MB RAM cards for a maximum of 1GB of memory. Just about every Macintosh model has such subtle technical differences. For more information, go to AppleCare Service and Support ([www.apple.com/support](http://www.apple.com/support)) and search for Apple Memory Guide.

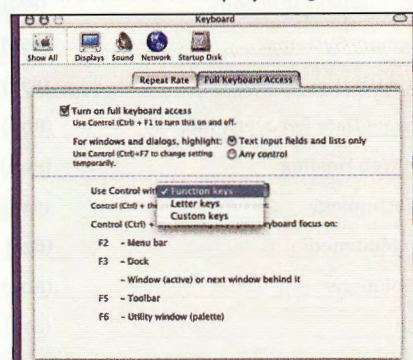
**Q** I would like to install two large hard drives from my old Power Mac G3 in my new LCD iMac with G4 speed. Is there a way to do this?

**A** The short answer is no, although some brave soul is sure to try. More RAM and an AirPort card are all you can officially install in the iMac's little dome. As for your hard drives, we can't say enough about using external FireWire enclosures. They're plenty fast, easy to install and upgrade, and—best of all—portable. Many companies sell FireWire enclosures for hard drives, CD-RW drives, and DVD drives. Check out FireWire Direct ([www.firewiredirect.com](http://www.firewiredirect.com)) or Other World Computing ([www.macsales.com](http://www.macsales.com)) to peruse the large selection of enclosures.

**Q** In the Windows operating system, I can navigate menus from the keyboard. Can I do this on my Mac?

**A** Apple added keyboard-based menu navigation in Mac OS 10.1. From the Keyboard preference panel (in System Preferences), click the Full Keyboard Access check box at the top of the panel. This option lets you use your keyboard's arrow keys to navigate menus,

the Dock, dialog boxes, and anything else you can access with the mouse. The space bar, for example, is equivalent to a mouse click. Apple designed this feature to give users with certain disabilities, such as limited hand and wrist mobility, other interface options; however, everyone can use this feature to simplify navigation.



**Bye-bye, mouse! Full Keyboard Access lets you navigate Mac OS X using only the keyboard.**

**Q** The screen on my monitor has a tinted color. How can I fix it?

**A** Chances are you can't. Monitors are generally not a peripheral that users can fix. When you see a tinted color, all you can do is make sure that the computer connection is seated firmly and that no

## How the Desktop DB File Can Burn You

**Q** What information does Mac OS 9's Desktop DB file contain?

**A** You probably know that you can rebuild the Desktop DB file by holding down Command and Option at startup (this is commonly called rebuilding the Desktop), but what exactly is this file? Desktop DB keeps track of file icons. It maintains file-creator links so your Mac knows what application to open when you double-click a file icon, and it stores the information that appears in the Comments box of a file's Get Info window. A great piece of freeware, Desktop DB Diver (Thomas Tempelmann, [www.tempel.org/macdev](http://www.tempel.org/macdev)), lets us graphically view the information in the Mac OS 9 Desktop DB file.

So who cares? You should, particularly when you're burning files to CD for distribution to other people. When you add comments to a file in the Get Info window's Comments box, you occasionally add sensitive information, such as certain URLs, that's meant for your eyes only. As you burn these files to CD, the CD-creation software burns all the data from the Desktop DB file onto the CD—including

any sensitive information you don't want to pass along. Even worse, according to Roxio (maker of Toast CD-burning software), the Desktop DB file *may* contain information from previously deleted files, whose Comments information anyone could view with a low-level hex editor.

How can you fix this? The easy way is to use Roxio's Toast 5 Titanium (\$89.95, [www.roxio.com](http://www.roxio.com)). The 5.1.2 update can write a limited or even empty Desktop DB file. If you don't use Toast, keep shared files on a separate drive volume or partition that maintains its own Desktop DB file with no sensitive comment information. Burn all your CDs from that volume.

Apps of volume "Dagge HD"

ids	type	creator	creation date	version	i	B	path
-1	APPL	G4ac	Wed, Apr 4, 2001		•	•	DaggeHD-BTL
-2	APPL	ATyp	Tue, Jul 1, 1997	4.2	•	•	DaggeHD-BTL
-1	APPL	ATyp	Tue, Jul 1, 1997	4.2	•	•	DaggeHD-BTL
-3	APPL	BArb	Mon, Nov 19, 2001		•	•	DaggeHD-BTL
-2	APPL	BArb	Wed, Jul 4, 2001		•	•	DaggeHD-BTL
-1	APPL	BArb	Fri, Jan 15, 2001		•	•	DaggeHD-BTL
-2	APPL	ByCl	Wed, Sep 13, 2000		•	•	DaggeHD-BTL
-1	APPL	ByCl	Wed, Sep 13, 2000		•	•	DaggeHD-BTL
-1	APPL	D64R	Wed, Jul 12, 2000	1.2.5	•	•	DaggeHD-BTL
-1	APPL	C64	Wed, Jul 12, 2000	2.8.1	•	•	DaggeHD-BTL
-1	APPL	CP5H	Sat, May 26, 2001	0.37b14	•	•	DaggeHD-BTL
-2	APPL	D64	Tue, Dec 28, 1999	1.1.7	•	•	DaggeHD-BTL
-1	APPL	D64	Tue, Dec 28, 1999	1.1.7	•	•	DaggeHD-BTL
-1	APPL	D5H	Fri, Oct 26, 2001	6.5.1	•	•	DaggeHD-BTL
-1	APPL	D2p	Fri, Oct 26, 2001	6.5.1	•	•	DaggeHD-BTL
-2	APPL	D64	Wed, Jul 12, 2000	2.8.1	•	•	DaggeHD-BTL
-1	APPL	D64	Wed, Jul 12, 2000	2.8.1	•	•	DaggeHD-BTL
-24	APPL	D64P	Thu, May 31, 2001	4.8.4	•	•	DaggeHD-BTL
-25	APPL	D64P	Sun, Jan 30, 2000	4.8.4	•	•	DaggeHD-BTL

**Mac OS 9's Desktop DB file contains tons of information—some of which you'd probably rather keep to yourself.**



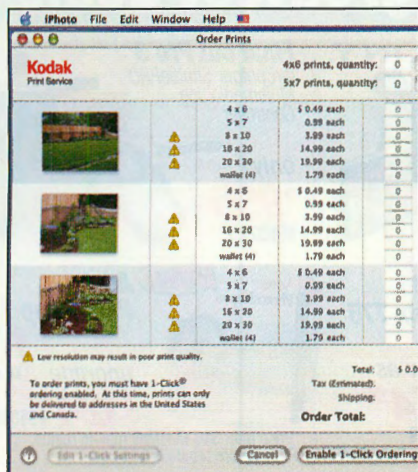
pins are bent. If that doesn't fix things, it's time for a new monitor. If you still want to try to repair your monitor, most repair shops will work on it for a set fee. Get a quote and decide if this is a cost-effective option. Remember that you should *never* take apart a monitor. Even when the monitor is unplugged, its picture tube contains very high voltages.

**Q** When I'm printing photos from my digital camera using iPhoto's online print service, what size should I make my files so they look their best at different printed sizes?

**A** Apple's iPhoto online photo-printing service gives you guidelines for printed image quality. The truth is this: If you've taken a low-quality, low-resolution photo, it will probably look pretty bad printed at 8 by 10 inches. Most digital cameras these days produce images that print well at smaller sizes, but following are some rough guidelines for larger-sized prints:

TO PRINT AT...	MAKE THE FILE SIZE...
Wallet size	640 by 480 pixels
4 by 5 inches	768 by 512 pixels
5 by 7 inches	1,152 by 768 pixels
8 by 10 inches	1,536 by 1,024 pixels

Source: AppleCare Knowledge Base

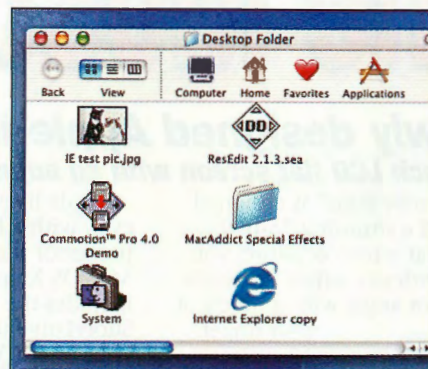


iPhoto's little warning triangles tell you your digital photo may not print well at certain sizes.

**Q** When I run Mac OS X, I can't find the Mac OS 9 Desktop icon to open certain files I stored there. Where is it?

**A** Your installation of Mac OS X should have included an alias on the desktop called Desktop (Mac OS 9), pointing to the invisible Desktop Folder at the root of your

hard drive. If this alias has disappeared, you can easily get to the Mac OS 9 desktop using the Finder. Select Go To Folder from the Go menu. In the resulting dialog box, type the name of your drive followed by /Desktop Folder. For example, our drive is named gDisk, so we typed gDisk/Desktop Folder. Click the Go button to open the Mac OS 9 Desktop Folder for your drive. Every drive volume has its own Desktop Folder, so you can access other drives or partitions the same way. If you're looking for your Desktop Folder in OS X, you'll find it in your user folder.



Find that OS9 Desktop with Go To Folder.

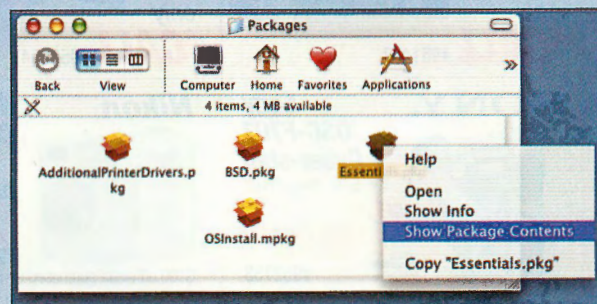
## The OS X Custom Installation Workaround

**Q** In Mac OS 9, it is easy to custom-install just a certain component of the operating system. How on Earth can you do this in Mac OS X?

**A** Mac OS 9 and earlier installation CDs always had a custom-install button or pull-down menu that allowed you to install just a few parts of the system software that needed replacing. Although Mac OS X doesn't yet have a custom install, there is one (albeit cumbersome) way to extract only the files you need. You extract the .pax.gz file from your Mac OS X system disc and expand this file to gain access to all the installer CD's files, which you can then drag and drop to the appropriate location on your hard drive. Here's how it's done.

First, make sure you have Mac OS 10.1.2 or later installed. Insert the Mac OS X installation disc and navigate to the invisible System > Installation > Packages folder. (We used Sherlock to search for the Packages folder and then double-clicked the icon to open it.) In this folder, find the appropriate .pkg file (for the full-install CD, it's Essentials.pkg) that contains the information you need. Open this file by Control-clicking it and choosing Show Package Contents. This will open another folder.

Navigate to Content > Resources and find the Essentials.pax.gz file. Copy this file to your hard drive. To extract all the files from Essentials.pax.gz, use Scott Anguish's OpenUp 3.0 PB1 for Mac OS X Public Beta ([www.stepwise.com/Software/OpenUp](http://www.stepwise.com/Software/OpenUp)), which extracts them to the OpenUp folder in the Library folder. You can then browse and copy over any particular file you need.



Using this handy Control-click, you can view the contents of any package file.



Knowing the location of packages can help you custom-install Mac OS X.



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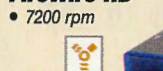
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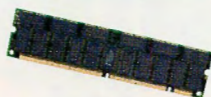
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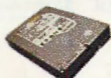
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<b>C-4040</b> *4.1 MP *3x Zoom	<b>E-10</b> *4 MP *4x Zoom	<b>C-700</b> *2.1 MP *10x Zoom

## Nikon

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<b>DSC-S85</b> *4.1 MP *3x Zoom	<b>DSC-S75</b> *3.34 MP *3x Zoom	<b>DSC-P71</b> *3.34 MP *3x Zoom
<b>DSC-P3</b> *2.76 MP *1920x1440 Max Res.	<b>DSC-P31/P51</b> 1.92 MP P31: *33 mm Fixed Lens P51: *2x Zoom	

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<b>POWERSHOT S110</b> *2 MP *2.8x Zoom	<b>POWERSHOT S-30/300</b> S-30: *3.14MP, *3x Zoom S-300: *4.1 MP *2.8x Zoom	
<b>POWERSHOT A30</b> *2.1 MP *3x Zoom *Built-in Flash	<b>POWERSHOT S40</b> *4 MP *3x Zoom	

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<b>PV-VM202</b> Mini-DV *Leica Dicomar Lens *16Mb SD Card *Dual Image Stabilization (Record & Playback) *1MP CCD *SD Voice Recorder	<b>ZR45MC</b> Mini-DV *18x Zoom *1/6 460K Pixel CCD *Memory Card *Color Nightshooting mode	<b>OPTURA 100MC</b> Mini-DV *1.3 MP *10x Zoom *Editing Capabilities GL-1	<b>DCR-IP7BT</b> MicroMV™ SteadyShot *10x Zoom *MPEG2 com- pression technology *Email right from Camera
<b>PV-L651/602/702/</b> Mini-DV *10x Optical *700x Digital *1 MP CCD NEW! *Built-in digital Still Camera save to mini DV tape 602: 2.5" LCD 702: 3.5" LCD	<b>ZR40</b> Mini-DV *18x Zoom *1/6 460K Pixel CCD *2.5" LCD	<b>XL-1S</b> Mini-DV *3 CCD Plus Pixel Shift *20x Zoom *Editing Capabilities	<b>DCR-PC9</b> Mini-DV SteadyShot *10x Zoom
		<b>PC-120BT</b> Mini-DV *1.5 Mega Pixel CCD *10x Zoom *Network Connectivity	<b>CCD-TRV108</b> *20x Zoom *Nightshot *2.5" LCD
		<b>DCR-TRV18/25/27/50</b> Mini-DV *10x Zoom *120x Digital Zoom *USB Streaming *2.5" LCD *Web Cam *VGA Stills * Super Nightshot *25: 1 MP CCD *27: 3.5" LCD *50: Blue Tooth wireless Technology	<b>CCD-TRV308</b> *Built-in Video Light *SteadyShot *2.5" LCD *Nightshot
		<b>DCR-TRV140/240/340</b> Digital-8 Steady Shot Image Stabilization 140: 20x Zoom 240: 25x Zoom 340: Digital Still Memory Mode	<b>DCR-TRV900</b> Mini-DV *Digital Still Mode *12x Zoom

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<b>Nikon</b> <b>Coolscan 8000ED</b> *4000 DPI *Image Correction Enhancement	<b>MINOLTA</b> <b>Dimage Scan Multi Pro</b> *4800 DPI *16 Bit Output Capability	<b>Canon</b> <b>Canoscan FS-4000</b> *4000 DPI *Eliminates Dust & Flows
<b>Coolscan 4000ED</b> *4000 DPI *Image Correction Enhancement	<b>Dimage Scan Elite</b> *2820 DPI *16 Bit Output Capability	<b>Canoscan FS-2720</b> *2720 DPI *36 Bit Scanning
<b>Coolscan IV ED</b> *2900 DPI *Max File Size 70MB *Nikon Optics	<b>Dimage Scan Dual II</b> *2820 DPI, For Medium Format Film	<b>Polaroid</b> <b>Sprints can 4000</b> *4000 DPI, Ideal for Scanning 35mm & APS Film

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<b>GR-DVL820/GR-DVL920/</b> Mini-DV *10x Optical Zoom *700x Digital Zoom 820: *Analog Input 920: *Color Viewfinder *16 Mb Card	

## SONY

<b>DCR-TRV18/25/27/50</b> Mini-DV *10x Zoom *120x Digital Zoom *USB Streaming *2.5" LCD *Web Cam *VGA Stills * Super Nightshot *25: 1 MP CCD *27: 3.5" LCD *50: Blue Tooth wireless Technology	<b>DCR-TRV 740/840</b> Digital-8 *Super Steady Shot *15x Zoom 840: *1MP CCD Technology
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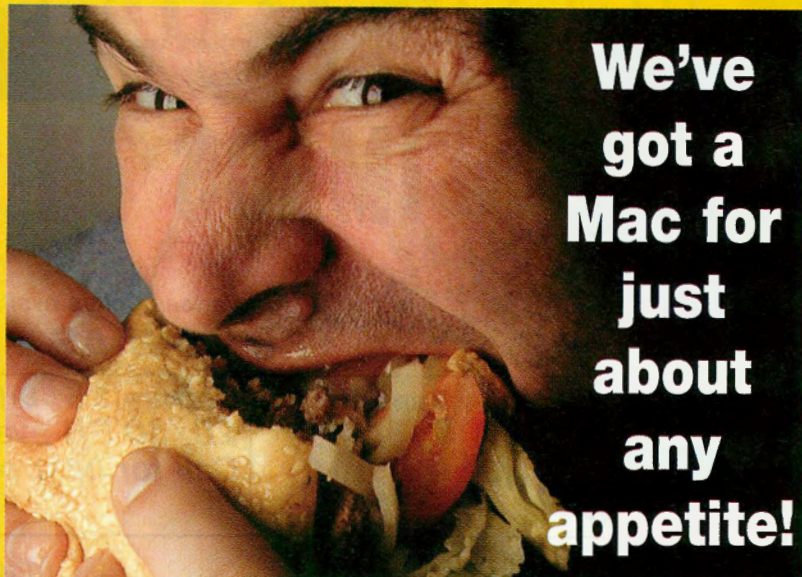
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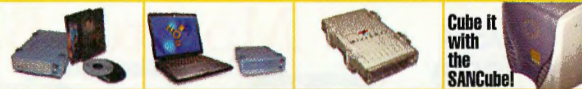


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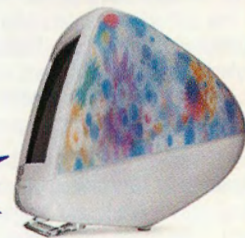


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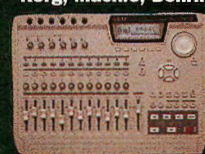


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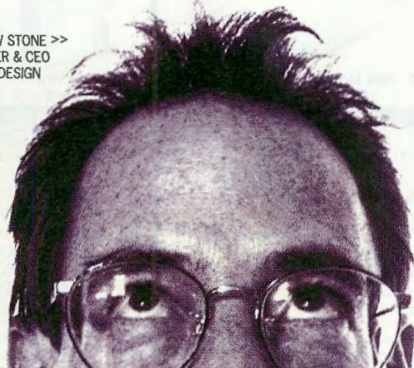
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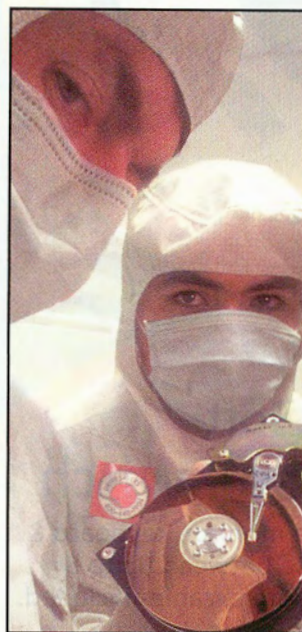


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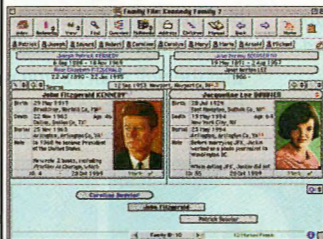
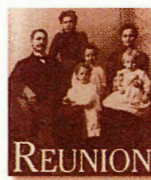


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# shut down

Don't let the back cover hit you on the way out.

## iMac

### hardware

**Company:** On The Web Marketing Group

**Contact:** [www.otwmg.com](http://www.otwmg.com)

**Price:** \$29.99

**Requirements:** Household power supply, darkness

**Y**ou get what you pay for. That old saying gains added meaning with the debut of the much-hyped and suspiciously inexpensive new iMac.

Much to our surprise, our local hardware store had an abundant supply of iMacs—and

at a mere \$34.99, it felt like a guilty impulse buy. Installation was a snap, but then we hit some snags. Most unsettling was the fact that the unit didn't come with *anything*: no mouse, no keyboard, no software. As we couldn't plug in any of our old USB devices,

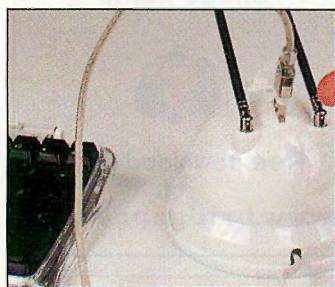
we were stuck from the get-go.

We forged ahead, but were disappointed yet again when we plugged it in and powered up, and saw no sign of booting.

We still don't know how the small and very bright screen will look when the OS is up and running, but we *do* know that if you look at it too long you'll get a headache.

In fact, every aspect of the new iMac will probably give you a headache.—W. B. Jones

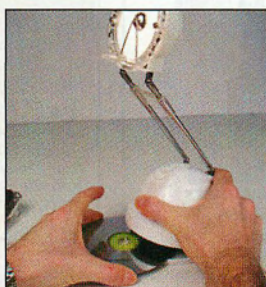
**good news:** Sleek. Stylish. Bright.  
**bad news:** No computing power.



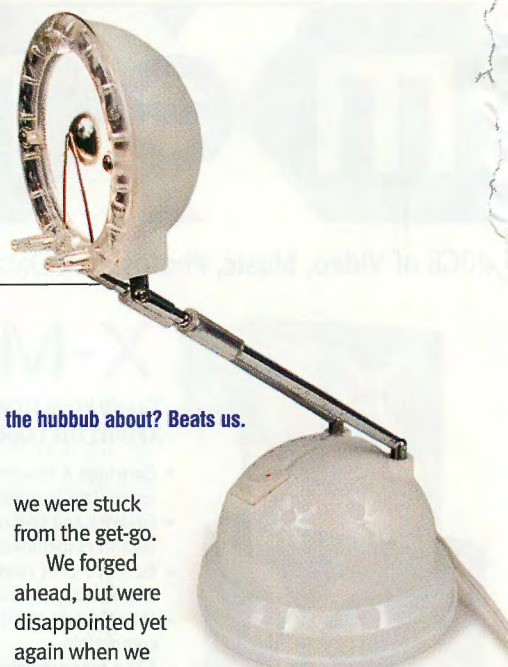
Plugging the keyboard into the weird USB port didn't help much.



Ouch! Prolonged viewing just hurts your eyes.



In this case, it's a CD-NA.



What's all the hubbub about? Beats us.

## Engineer Defends Earbud Design

*"They fit perfectly into the human ear."*

**A**ngus Pàidean, a Scottish-born Apple engineer, is upset at the amount of criticism that's been leveled at the size of the iPod earbuds he designed. "Aye, the letters 'ere been droochit like rain on the Isle of Orkney!" an excitable Pàidean exclaimed. He followed with, "I'll wager we're only 'earing from the lot wi' the wee little ears—nasty buggers, the lot of 'em!" Apple CEO Steve Jobs declined to comment.



## Book Review: G4 Cookbook

*"I simply knew I must put meat inside my G4!"*

**C**onsidering all that heat energy sizzling inside our G4 cases, the most surprising thing about the *G4 Cookbook* is that it took so long for the idea to occur to anyone. That oversight's been rectified—and how!—by "Bar-B-Guru" Ewan Podgourney. In his prescient first take on everyone's favorite hot box, Podgourney guides us through the intricacies of slab-meat cooking, the major wieners, and game birds. The book is quite nearly flawless, empowering the reader with artful creations, detailed preparatory notes, and a playfulness too often lacking in mainstream cookbooks.

**NEW: Dual GHz Edition—Hotter than Ever!**

## G4 Cookbook

**Hundreds of Heatsink Recipes!**

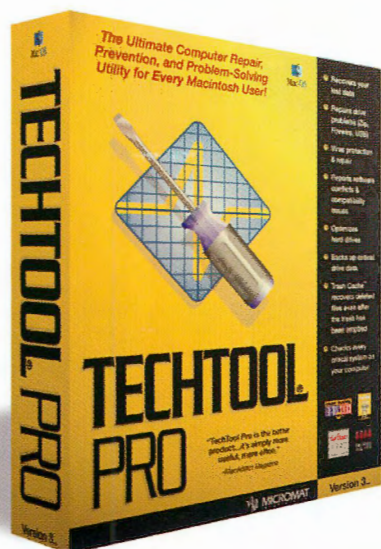


**Ewan Podgourney**

Forward by Stuart Podgourney



## In with the new...



TechTool Pro 3 is the super utility for your Macintosh. Besides repairing and recovering data, TechTool Pro can help you circumvent problems in the first place. Our new virus detect and repair feature, as well as our software conflict check feature, lets you keep your computer in tip-top shape. When booted from the included emergency CD, you can even check, repair and optimize your OS X computer.

Every day, more and more Macintosh professionals are choosing TechTool over other system utilities. In fact, even Apple Computer includes TechTool Deluxe with every copy of their AppleCare™ Protection Plan. Simply put, TechTool Pro 3 is the most complete and powerful troubleshooting utility available for your computer. Why would you settle for anything less?

## In with the newer...



For Apple's next-generation operating system, you'll need a next-generation disk utility. That's why Micromat has introduced Drive 10, the first and final disk utility for Mac OS X. Problems with your drive? Drive 10 can repair almost any drive problem with one simple click of your mouse. All within OS X's native environment.

While Drive 10 is a new product, it is derived from TechTool Pro, Micromat's world-class diagnostic and repair utility. Using TechTool's time-tested routines as well as some new routines developed exclusively for OS X, Drive 10 offers many tools for checking and repairing any drive on your system. Don't entrust your OS X drive to ancient utilities. Protect your data and drive safely with Drive 10.



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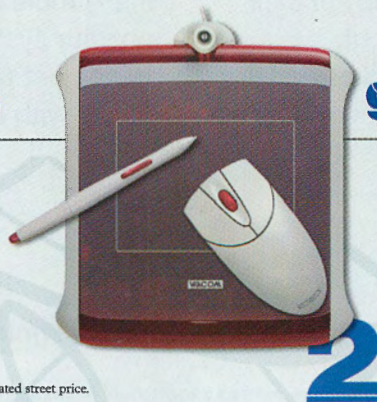


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